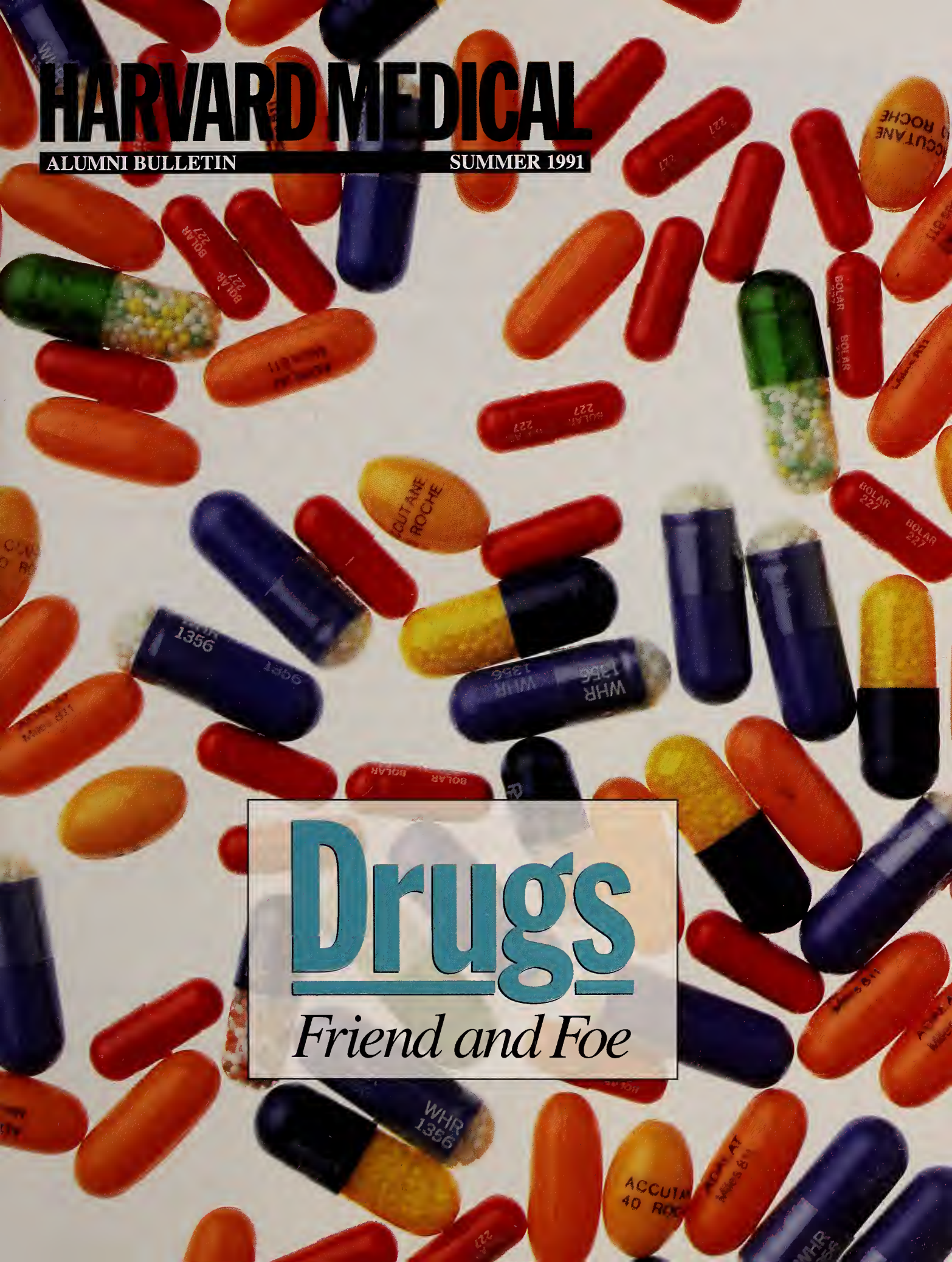
HARVARD MEDICAL
ALUMNI BULLETIN SUMMER 1991



Drugs

Friend and Foe

FIND OUT HOW TO GET A MILLION-DOLLAR MANAGER FOR YOUR $100,000 PORTFOLIO.

Select Managers is Shearson Lehman Brothers' exclusive program that can put one of 17 of the country's leading independent money managers to work for you.

These Select Managers ordinarily manage only portfolios in excess of $1 million. But now your Select Managers' account of $100,000 or more can be matched to a manager whose investment philosophy is most appropriate to your financial objectives and risk tolerance.

To find out how a million-dollar portfolio manager can work for you, call Shearson Lehman Brothers at 1-617-739-8704. Or return the coupon.

SHEARSON LEHMAN BROTHERS

AMERICAN EXPRESS®

CALL: 1-617-739-8704

Or write: Martin B. Stocklan Sr. V.P.
(Harvard MBA 1966)
Chestnut Hill Plaza
Chestnut Hill, MA 02167

For Shearson Lehman Brothers Select Managers

☐ *Please send me more information on Shearson Lehman Brothers Select Managers.*

NAME (please print)

☐ PLEASE CHECK IF YOU ARE A SHEARSON LEHMAN BROTHERS CLIENT.

ADDRESS

BRANCH LOCATION

CITY STATE ZIP

NAME OF FINANCIAL CONSULTANT

BUSINESS PHONE HOME PHONE

SHEARSON LEHMAN BROTHERS • FOSTER & MARSHALL INC. • THE ROBINSON HUMPHREY COMPANY, INC.

HARVARD MEDICAL

ALUMNI BULLETIN / SUMMER 1991 / VOL. 65 NO. 1

FEATURES

DEPARTMENTS

Cover: © Walter Bibikow 1988/The Image Bank

INSIDE H.M.A.B.

Where drugs are concerned, there are the good, the bad and the ugly. In this issue, we glance at effects of the good and the bad—the legal and the illegal—and the fuzzy area in between. The "ugly" results—cocaine babies and the drug-induced nightmares played out on urban streets—we'll leave to another time.

We start with a physician's own story of his fall into and rise out of addiction, and follow with Sherwin Nuland's account of William Halsted, who despite an addiction helped bring surgery in this country out of the dark ages. Side stories tell of the Massachusetts Medical Society's program to support physicians into recovery from chemical dependencies, and of an HMS student-initiated peer counseling center. (HMS deans have also been working on substance abuse initiatives, which we'll reveal next issue if passed by the Faculty Council.)

Lester Grinspoon '55 expresses his concern about the government's Prohibition-like approach to illicit drugs. And David Greenblatt '70 presents an Orwellian vision of professional life should mandatory random drug testing be instituted. Is the new Big Brother watching us?

Richard Evans Schultes describes the medicinal properties of just a few of the thousands of plant specimens he has collected in the Amazon rain forest. Jeffrey Speller '74 depicts the alcoholic senior business executive as a corporate casualty. And in time for the upcoming 1992 Olympics, Rafael Campo '91 reports on the use of performance-enhancing drugs among athletes.

We close with a view from the legal side. Michael Rosenblatt '73 tells why he made the move from academia to the pharmaceutical industry, and answers some questions about how new drugs are discovered.

—Ellen Barlow

HARVARD MEDICAL
ALUMNI BULLETIN

The *Harvard Medical Alumni Bulletin* is published quarterly at 25 Shattuck Street, Boston, MA 02115 © by the Harvard Medical School Alumni Association. Telephone: (617) 432-1548. Third class postage paid at Boston, Massachusetts. Postmaster, send form 3579 to 25 Shattuck Street, Boston, MA 02115. ISSN 0191-7757.

LETTERS

Brings Back Memories

In the September (okay, October) of a medical career, I found the piece of classmate George Bascom in the Spring '91 issue a particular source of pleasure. His vivid prose brought to life both the excitement and the anxieties of the New Pathway to those of us trained in the familiar preclinical-clinical dichotomy. More than that, his article was a '52 minifeast. A leap across the years came from the references to classmates Grunebaum, Malcolm, Cochran and Bascom, as well as remembered near-classmate Federman. George's crystal recollection of Dean Burwell was exactly right. The dean's explanation of constrictive pericarditis, his courtly deference to the patient, and his magnificent eyebrows are all unforgettable. Thanks George for a lively, anamnestic September Song.

—James S. Bernstein '52

Learning From Legacies

A remarkable coincidence: this afternoon I came home to read the wonderful tributes to Dr. Castle, and Carl Walter's description of how he learned about hospital infection by simple bedside observations (Spring '91). A few hours earlier today, I told a group of medical residents at the Brockton V.A. how I first learned the scientific method in a similar bedside exercise from Dr. Castle at the Boston City Hospital in 1937.

We students were standing around a lady's bed philosophizing (meaning guessing) if she had a urinary tract infection. Dr. Castle said, "Boys, let's find out." He pulled the curtains, rolled up the bed, put a bedpan beneath her, we waited, then marched down the hall behind Castle with bedpan in his hand, looked at the urine under an old monocular scope and made the diagnosis.

I agree with Carl Walter, esoteric science and treatments we forget, but fortunately the character of great teachers and their approach to problems we often remember. It's sort of miraculous that some teachers can have a lasting influence on an ordinary medical student—faces in the crowd so to speak.

—Frank J. Lepreau '38

Moving?

Please send your change of address to:
Harvard Medical Alumni Bulletin
25 Shattuck St.
Boston, MA 02115

Name

Old address

New address

PULSE

Two New Chairs Filled

Two chairs at Harvard Medical School have been filled by first incumbents. David H. Sachs '68 has been named the Paul S. Russell/Warner Lambert Professor of Surgery, and Stuart Schlossman, MD will be the first Baruj Benacerraf Professor of Medicine.

Sachs, like Russell, the John Homans Professor of Surgery, has devoted his research to overcoming obstacles to successful organ transplantation. Sachs's interest in transplant biology started during a fellowship at MGH with Russell. Sachs returns to MGH from the National Cancer Institute, where he was chief of the Immunology Branch. Before that he served as chief of the Transplantation Biology Section of the National Institutes of Health, a position he had held since 1974.

Russell's recent research has focused on the possibilities of "gene therapy" in transplantation. He and his colleagues use molecular biological techniques to introduce functioning insulin genes into recipient mice, which

SUSAN R. MCGREEVEY

David H. Sachs (left), the first Paul S. Russell (right) /Warner Lambert Professor of Surgery.

BARBARA STEINER

Baruj Benaceraff (left) and Stuart Schlossman, the first Baruj Benaceraff Professor of Medicine.

BARBARA STEINER

Jutta Worwag '93 and her physician-mother, Ingrid, attend a Parents' Day presentation. On March 9, 1991 about 200 parents and friends of HMS students experienced a day in the life of a student at Harvard Medical School. They sat in on a mock tutorial presented by first-year members of the Castle Society, attended open houses at the academic societies, and toured the campus. The Second-Year Show cast provided entertainment during luncheon, served in Vanderbilt Hall. Daniel Federman '53, dean for medical education, welcomed everyone: "The development of the New Pathway has been a process of evolution. It is a luxury for us to have children like yours to help in our search for improved medical education."

some day may mean that only a faulty gene and not a whole organ may need to be replaced. They are also trying to graft only selected tissues from donor organs to minimize organ rejection.

Sachs's most current research focuses on bone marrow transplantation to aid in the transplantation of other organs. He wanted to learn if there were a way to treat the donor marrow so it would not attack the host, and has been trying "chimeric" bone marrow transplants, created by mixing the donor's marrow with the recipient's. Using a mouse model, Sachs has found that a graft survives much longer when transplanted to a mouse whose marrow has been replaced with a T-cell-depleted chimeric marrow. He has also found a potential application for leukemia treatment: while T-cell-depleted chimeric transplants do not attack the recipient's healthy cells, they do attack leukemia cells.

The second new HMS chair brings together two colleagues in the field of immunology, Benacerraf and Schlossman. Benacerraf, the president of the Dana-Farber Cancer Institute (DFCI) and HMS George Fabyan Professor of Comparative Pathology, is most noted for his Nobel Prize discovery of the Ir—immune response—genes, which serve a central role in the recognition of pathogens. Today most basic science research on the immune response and many new clinical treatments for disorders involving the immune system (from AIDS to autoimmune disease to cancer) build upon the theoretical framework he provided.

While Benacerraf's work has focused on the genetics of immunity, Schlossman, chief of the division of tumor immunology at the DFCI, has concentrated on the protein structures of immune cells. Schlossman has found various ways to separate and study subsets of lymphocytes and was one of the first to take advantage of monoclonal antibody technology. The basic understanding of AIDS, for example, required the methodical separation of lymphocytes that Schlossman pioneered. Another important use of Schlossman's monoclonal antibodies is in diagnosing cancers involving white blood cells.

In addition to diagnostic tools, Schlossman has contributed to the development of new therapies, including autologous bone marrow transplantation. In this therapy, a patient's own bone marrow is cleansed of its cancer cells and reintroduced after the rest of the immune system is destroyed by x-rays. Currently, Schlossman and Benacerraf are collaborating on the development of immunotoxins against leukemia and lymphomas.

The Russell/Warner-Lambert chair was endowed by Warner-Lambert Co. of New Jersey to further surgery-based immunological research, and to "honor Dr. Russell and to express appreciation for his many contributions to the field of surgery, and, in particular to the field of transplantation."

The Benacerraf chair is funded by the trustees of the Dana-Farber Cancer Institute. "I am deeply honored to have a professorship established in my name at Harvard Medical School," commented Benacerraf, who, after 21 years at HMS, will retire at the end of June. □

STEVE GILBERT

R. Bruce Donoff succeeds Paul Goldhaber as dean of the Harvard School of Dental Medicine.

New Dean for Dental School

R. Bruce Donoff has been appointed 10th dean of the Harvard School of Dental Medicine (HSDM). A 1973 graduate of HMS, Donoff has served as professor and chairman of the Department of Oral and Maxillofacial Surgery (OMS) at HSDM and chief of the school's OMS service at Massachusetts General Hospital since 1983. Donoff succeeds Paul Goldhaber, who stepped down as HSDM dean last June after 22 years to rejoin the faculty as professor of periodontology.

In addition to his post at MGH, Donoff holds appointments at five

other hospitals and medical centers in the greater Boston area. As a member of HMS's New Pathway Doctor/Patient Relationship Committee, he helped organize the patient/doctor course for the dental students. Says Donoff: "The course has been very successful in meeting its objective: to develop patient-interviewing skills, show the patient's side of the relationship, and explore what a doctor actually does. But it is also an important factor in helping to shape the identity of the dental students, since it is the one course in which they are separated from the medical students during the first two years."

Through his research, Donoff has made many notable contributions in wound healing, nerve regeneration and repair, and orthognathic surgery (jaw repair), and through his identification of biological markers of oral cancers. He also has helped pioneer the development of surgical techniques to replace diseased or damaged maxillofacial bone and to repair damaged nerves in patients with oral cancer. □

The Match Is Struck

The first class to learn exclusively by New Pathway methods scored a match point on March 20 as 85 percent of those matched were accepted into one of their first three choices, and 69 percent got their first choice. "On behalf of all the members of the faculty, I congratulate you for your spectacular success," Dean Daniel Tosteson '48 told the class during a celebratory luncheon.

The class's achievement was a fine way to bid farewell to Curtis Prout '41, assistant dean for student affairs and chairman of the Internship Advisory Committee. Prout retired in December 1990 after 17 years of presiding over student matches. "It was the best job I ever had, and I loved it," says Prout. Edward Hundert '84 will assume Prout's internship advisory role.

Internal medicine, continuing with its recent increased popularity, has 33 matches. Although down from 43 last year, this specialty is still on top. Pediatrics is second with 22 matches, same as last year. Ophthalmology and orthopedics came in high with 13 and 12 respectively, while surgery is still low with 13, up 1 from last year. This year saw a big drop in radiology, from 19 matches last year to only 7 this year.

Through the initiative of Beth Rider '91, a new trend—residency sharing—was set this year. She and Jim Plews-Ogan '91 will be sharing a residency in pediatrics at Children's Hospital. Plews-Ogan, whose wife, Peggy, also Class of '91, gave birth to their daughter Erin on March 24, and Rider, who has two young children, both wanted a residency that would allow them the flexibility to spend time with their families. Rider and Plews-Ogan will alternate months on clinical rotations, leaving them time off for their families, research and other interests.

Associate Dean of Student Affairs Edward Hundert '84 (left) with Curtis Prout '41, who after 17 years is retiring from his role as assistant dean of student affairs and chairman of the Internship Advisory Committee.

Prout, who called the shared residency "a great idea," acknowledged that such matches are part of a relatively new mechanism that tries to find matches for couples. And, as Rider says: "People shouldn't have to choose between career and family. With our arrangement, Jim and I will have the time to be good parents as well as good residents."

Graduates and their intended specialties are:

ANAESTHESIA

Appel, Marvin
Johns Hopkins, MD

Bennett-Guerrero, Eliot
Duke University Medical Center, NC

Gomez, Martha
University of California/San Francisco

Gutierrez, Christina
Cleveland Clinic Foundation, OH

Leffert, Lisa
Brigham & Women's Hospital, MA

Marroquin, Edmundo
Massachusetts General Hospital

EMERGENCY MEDICINE

Gonzales, Scott
Kern Medical Center, CA

Moore, Jude
University of Southern California

Paik, Leo
Denver General Hospital, CO

Sokolove, Peter
Harbor-UCLA Medical Center, CA

Tarter, Thomas
Sparrow Hospital, MI

Sharing a match at Children's Hospital are Jim Plews-Ogan (left) and Beth Rider (holding her daughter Emily). With them are Jim's wife, Peggy Plews-Ogan '91, Rider's husband, Brook Longmaid, MD, and their son Parker.

PHOTOS BY BARBARA STEINER

FAMILY PRACTICE

Gish, Katherine
Mountain Area Health Education Center, NC

Kent, Dana
Natividad Medical Center, CA

MEDICINE

Abookire, Susan
Brigham & Women's Hospital, MA

Alvarez, Ruben
Kaiser Permanente Medical Center, CA

Araten, David
Presbyterian Hospital, NY

Arbiser, Jack
Beth Israel Hospital, MA

Athill, Charles
Massachusetts General Hospital

Barton, Mary
Brigham & Women's Hospital, MA

Bettinger, Lise
Santa Clara Valley Medical Center, CA

Biegelesen, Elizabeth
Boston City Hospital, MA

Blitzer, Mark
Brigham & Women's Hospital, MA

Carter, Jennifer
Mount Auburn Hospital, MA

Charles Moore (left) and Selwyn Rogers match to Mass. General and Brigham and Women's.

Chaudhry, Hina
Duke University Medical Center, NC

Daley, George
Massachusetts General Hospital

Dauerman, Harold
Massachusetts General Hospital

Donovan, Carolyn
Duke University Medical Center, NC

Engels, Eric
Brigham & Women's Hospital, MA

Goldberg, Beverly
New England Medical Center, MA

Grund, Stephen
Massachusetts General Hospital

Hickey, Kathan
Strong Memorial Hospital, NY

Hwang, Sam
Brigham & Women's Hospital, MA

Kanter, Andrew
University of Washington Affiliate

Kim, Jim
Brigham & Women's Hospital, MA

Kimberg, Leigh
University of California/San Francisco

Ko, Albert
Brigham & Women's Hospital, MA

Kuhn, Duncan
University of Utah Affiliated Hospitals

Lee, Burton
Massachusetts General Hospital

Liebschutz, Jane
Boston City Hospital, MA

Liggett, William
Barnes Hospital, MO

May, Alison
Brigham & Women's Hospital, MA

Mullen, Mary
Massachusetts General Hospital

Murray, Christopher
Brigham & Women's Hospital, MA

Peckins, Christopher
Brigham & Women's Hospital, MA

Phillips, Susan
Boston City Hospital, MA

Pierluissi, Edgar
University of California/San Francisco

Plews-Ogan, Margaret
Brigham & Women's Hospital, MA

Ross, Bonnie
Brigham & Women's Hospital, MA

Rupnick, Maria
Brigham & Women's Hospital, MA

Schmitt, William
Massachusetts General Hospital

Seminara, Stephanie
Massachusetts General Hospital

Shaw, Albert
Massachusetts General Hospital

Spell, Nathan
Brigham & Women's Hospital, MA

Stasior, David
Massachusetts General Hospital

Warren, Edus
Massachusetts General Hospital

Weinfeld, Mark
Brigham & Women's Hospital, MA

Weiss, Lisa
Massachusetts General Hospital

Williams, David
University of Washington Affiliate

NEUROLOGY

Chen, Chinfei
Massachusetts General Hospital

John Dalrymple (left) and Vinh Lam are happy with their matches: Brigham and Women's and Mass. General Hospital.

Nardin, Rachel
Harvard Longwood Program, MA

Schwamm, Lee
Massachusetts General Hospital

Sperling, Reisa
Harvard Longwood Program, MA

NEUROSURGERY

Friedlander, Robert
Massachusetts General Hospital

Mun, Edward
University of California/San Diego

Schwartz, Marc
Brigham & Women's Hospital

OB/GYN

Berck, David
Brigham & Women's Hospital, MA

Dalrymple, John
Brigham & Women's Hospital, MA

Holtzman, Sally
Kaiser Permanente Medical Center, CA

Hudson, Lori
Brigham & Women's Hospital, MA

Thomas, Angelyn
Georgetown University Hospital, Washington, D.C.

OPHTHALMOLOGY

Atebara, Neal
Wills Eye Hospital, PA

Ceisler, Emily
Massachusetts Eye & Ear Infirmary

Chogawala, Zoher
Massachusetts Eye & Ear Infirmary

Eydelman, Malvina
Long Island Jewish Hospital, NY

Ghogawala, Zoher
Massachusetts Eye & Ear Infirmary

Grossman, Gayle
Manhattan Eye, Ear & Throat Hospital, NY

Jordan-Moore, Rachel
University of Southern California

Kumar, Sanjiv
University of Southern California

Lee, Kenneth
Wills Eye Hospital, PA

Park, Donald
Pacific Presbyterian Hospital, CA

Pezeshgpour, Atoosa
Manhattan Eye, Ear & Throat Hospital, NY

Umlas, James
Tufts New England Medical Center, MA

Vaughn, Gregory
Wills Eye Hospital, PA

Wang, Ming
Wills Eye Hospital, PA

ORTHOPEDICS

Blazar, Philip
Hospital of the University of Pennsylvania

Cooley, Vernon
University of Washington Affiliate

Dvirnak, Paul
University of New Mexico School of Medicine

Elliott, Andrew
Yale-New Haven Hospital, CT

Hung, Gregory
University Health Center, PA

Khabie, Victor
Hospital for Joint Disease, NY

Martin, David
George Washington University, Washington D.C.

Messineo, Mark
New England Medical Center, MA

Mitchell, Matthew
Ohio State University

Theodore, George
Harvard Combined Orthopedic Program, MA

Warren, Paul
Texas Technical University Affiliated/ Lubbock

Wintman, Bruce
Harvard Combined Orthopedic Program

OTOLARYNGOLOGY

Moore, Charles
University of Michigan Hospitals/ Ann Arbor

Shapiro, Nina
Massachusetts Eye & Ear Infirmary

Strome, Scott
University of Michigan Hospitals/ Ann Arbor

Teknos, Theodoros
Massachusetts Eye & Ear Infirmary

PATHOLOGY

Blacklow, Stephen
Brigham & Women's Hospital, MA

Brennick, Jeoffry
Massachusetts General Hospital

Joseph, Jeffrey
Brigham & Women's Hospital, MA

Lee, Frank
Brigham & Women's Hospital, MA

Nora Jaskowiak (Univ. of California/ San Francisco) and David Greenes (Children's Hospital).

PEDIATRICS

Gonzalez, Wanda
Children's Hospital, MA

Greenes, David
Children's Hospital, MA

Gundersheimer, Joshua
Children's Hospital, MA

Jelin, Bess
University of California/San Francisco

Jordan-Moore, Rachel
University of Southern California

Koumans, Emilia
University of California/San Francisco

Kwan-Gett, Tao Sheng
University of Washington Affiliate

McIntee, Thomas
University of Colorado School of Medicine/Denver

Minkovitz, Cynthia
St. Louis Children's Hospital, MO

Otterman, Gabriel
Children's Hospital, MA

Peregrino, Manuel
Baylor College Medical School, TX

Plews-Ogan, James
Children's Hospital, MA

Rich, Michael
Children's Hospital, MA

Rider, Elizabeth
Children's Hospital, MA

Silverman, Lewis
Children's Hospital, MA

Taitel, Janice
Boston City Hospital, MA

White, Djuanna
Children's Hospital, MA

Wilson, Stephen
University of California/San Francisco

Woods, Monika
Children's Hospital, MA

Wylie, Pegeen
Children's Hospital, PA

Yee, John
Children's Hospital, MA

PSYCHIATRY

Anfang, Stuart
McLean Hospital, MA

Bonnar, Jay
Cambridge Hospital, MA

Grunebaum, Michael
The New York Hospital

Horner, Tia
Massachusetts General Hospital

RADIOLOGY

Bonaccio, Ermelinda
The New York Hospital

Parris, Steven
Tulane University School of Medicine, LA

Pearson, Gregory
Brigham & Women's Hospital, MA

Sadoski, Corinne
Brigham & Women's Hospital, MA

Slanetz, Priscilla
Massachusetts General Hospital

Sussman, Andrew
University of California/San Diego

Tucker, Julia
Massachusetts General Hospital

REHABILITATION

Audette, Joseph
Presbyterian Hospital, NY

Stroud, Lisa
UMDNJ-New Jersey Medical School

RESEARCH

Goldberg, Inna

O'Neill, Mary

Sah, Robert
Massachusetts General Hospital

Stromswold, Karin

SURGERY

Andersen, Craig
University of Colorado School of Medicine/Denver

Bruch, Jean
Massachusetts General Hospital

Joshua Gundersheimer (Children's Hospital) and Stephanie Seminara (Mass. General Hospital) congratulate each other on their matches.

Chung, Gakyung
Brigham & Women's Hospital, MA

Cooper, Jeffrey
New England Deaconess, MA

Eslami, Mohammad
University of Chicago Hospital, IL

Godley, Charles
Massachusetts General Hospital

Jaskowiak, Nora
University of California/San Francisco

Kovacs, Stephen
Barnes Hospital, MO

Lam, Vinh
Massachusetts General Hospital

Lukaszewicz, Gregory
Massachusetts General Hospital

Reed, Michael
Brigham & Women's Hospital, MA

Rivera, Jaime
Massachusetts General Hospital

Rogers, Selwyn
Brigham & Women's Hospital, MA

Terrazas, Ramon
University of California/San Francisco

Vigil, Daniel
Cedars-Sinai, CA

UROLOGY

Socher, Steven
Harvard Longwood Program, MA

OTHER

Cashel, James
Kennedy School of Government, Health Policy

Stelling, John
Echoing Green Public Service Fellowship

Where, Oh Where Can She Be?

Missing second-year HMS student Di Zygote was reunited with her twin sister Mona at this year's Second-Year Show, *Twin Geeks*. After an exhaustive search of HMS and environs by HST student Mona, her classmates and several illustrious faculty members, it was discovered that Di had not been murdered, as had been feared, but had fallen prey to an insidious syndrome plaguing many medical students—she had disappeared into her books, possibly related to her family history of ideopathic displacia (being lost for no reason). It is reported that when asked how they would celebrate their reunion, the twins replied, "We're going to Disney World!" □

Brad Marino (left) and Raj Mangrulkar tell of the joys of learning anatomy with "Raviola" during the Second-Year Show.

Students Jocelyn del Carmen, Gretchen Fisher, Lakshmi Halasyamani, Katherine Lemon and Anne West serenade "Dr. Dan Man," in search of the elusive "P."

Supersurgeon Folk-man (Brian Stidham) and his "lab slave" Robin confer with Wonder Woman (Renee Strucke) on how to find the missing sister, Di.

Drs. Ira Schmecklgrugber (Joel Pomerantz) and Lewis Schmecklgruber (Zack Gleit) speak at the HST Dinner Seminar.

PHOTOS BY JOHN LAUERMAN

CAMPAIGN REPORT

Campaign for Countway

When Harvard University President Joseph Willard first proposed a medical department for the university in 1782, he expressed the hope that the library would be "enriched with a collection of the most approved authors in anatomy, surgery, physic, chemistry, etc . . . a collection more perfect than any in America, as soon as circumstances will permit." In actuality, it took 183 years for the proper circumstances to develop. It was not until 1965 that a gift of $3.5 million from Francis A. Countway, former American president of Lever Brothers (the soap manufacturers), his sister Sanda, and the guidance of Dean George Packer Berry helped move the Harvard Medical Library from its cramped quarters on the second floor of Building A to a more perfect home, the Countway Library building just a few yards away.

Here, in combination with the Boston Medical Library—established in 1805 mainly by Harvard professors and Harvard graduates as the "physicians' library," and having grown in the meantime into one of the premier medical libraries in the world—the Countway Medical Library became one of the leading medical libraries not only in America, but throughout the world. The Countway Library now stands as the world's largest university-based medical library, and only the National Library of Medicine in Bethesda can boast a larger collection.

Over the past 26 years, the Francis A. Countway Library of Medicine has continued to progress toward the goal proposed by President Willard in 1782. The modern and antiquarian collections of the two combined institutions, and their utmost unparalleled collections of periodicals and journals, make the Countway one of the most balanced medical libraries anywhere. It is one of the few medical libraries in the world where an inquirer or researcher is likely to find whatever literature he or she is looking for—old or new.

However, during the interval since the Countway Library first opened its doors, outside events have taken place that have required adjustments in the Countway operation. The Vietnam War and the 1974 energy crisis brought on unparalleled inflation at the same time that President Richard Nixon dramatically decreased funding for research—two changes that immediately affected Countway. The cost of periodicals and new book purchases skyrocketed, and the cost of managing and operating the building itself increased enormously. Also, developing and changing technologies in recent years have forced a reevaluation of policies and methodologies to keep the library abreast of modern times.

To meet the challenges of today's problems and events, the Harvard Medical School and the Boston Medical Library in November 1990 launched a joint campaign to raise $20 million over the next five years. These funds will allow the library to make the necessary changes that will insure its health well into the future. The "Countway Campaign," as it is called, is headed by Paul Russell, MD, John Homans Professor of Surgery and chairman of the Joint Library Committee, and Grant Rodkey '43A, current president of the Boston Medical Library.

The campaign has five stated goals: to assure access and linkage to the world's biomedical literature; explore and promote effective utilization of information and knowledge; educate library users in the principles and techniques of information management; preserve an historical record through its scholarly, rare book and archival collections; and create a stimulating and synergistic setting for medical growth.

"I'm very excited about the support we've received and about the potential this campaign has for us," says Judith Messerle, head librarian. "Practicing medicine today means staying abreast of a plethora of constantly updated studies. It is essential for a medical library to keep up to date with those changes in order to meet the needs of its users."

According to Messerle, an improved information system is a vital component of the Countway Campaign. New technology, involving an automated library information system, databases and computerized library

Erratum

Our apologies to Brad Herzog, who in our last issue did not receive credit for three photos of Dr. William Castle he took (on pages 15, 18 and 27).

user workstations, would provide the capability to link libraries throughout the world to the Countway's information system. Once the new system is in place, a person carrying on research in a French library, for example, would be able to access, via his or her personal computer and telephone, the Countway's MEDLINE database to locate relevant information and bibliographic sources. Overnight, photocopies of pertinent articles and other literature could be expressed to France so that his or her research can continue uninterrupted.

Also critical is the need to manage and analyze all of the new information that is being published. As a response to this need, a new speciality, medical informatics, has been created. The following scenario shows how Messerle envisions medical informatics at work in Countway:

A clinician from a local hospital attends a Countway Medical Informatics workshop, having selected 35 articles on AIDS vaccine clinical trials. She needs to rapidly analyze the information contained in these articles to determine patient treatment plans. However, she does not have time to read, evaluate and statistically correlate each study's clinical data. What she learns in the Countway Medical Informatics workshop, with the assistance of a Countway librarian, enables the physician to evaluate an entire group of studies by entering each study's results into a specially designed informatics computer program. The program, developed by faculty and Countway librarians, is a model of intellectual and professional collaboration.

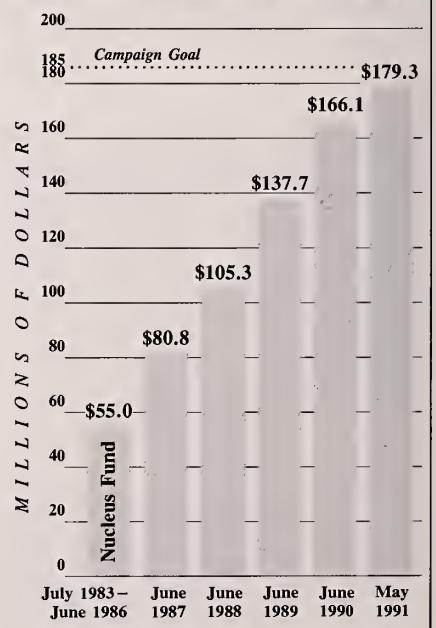
Other goals of the campaign are to endow a chair in library medicine and to establish a microcomputer training room and laboratory. Here, a corps of librarians will train library users how to most efficiently and effectively obtain the information they need.

Also vital to the overall balance of the Countway operation are the outstanding rare book and archival collections. Objectives for this part of the campaign include the endowment of the curator's position, the underwriting of additional staff positions, and programs related to preservation.

Other goals in the overall campaign will include the endowment of named book funds, the establishment of a substantial fund to underwrite periodical subscriptions, which have been inflating substantially in recent years, and funds to allow for making adjustments in the physical environment of the Countway Library.

According to Dorothy Newell, director of development for major gifts for the medical school, the Countway Campaign is intended to bring the Countway Library to its full potential—a caliber reflective of its students, researchers and physicians—and to develop the potential of the Harvard Medical Library that President Willard envisioned in 1782. Said Harvey Cushing, Class of 1895, during a 1926 address entitled "The Doctor and His Books": "As the calorimeter tells the activity of the patient's metabolism, so may you determine the plus or minus activity of the local profession in any district by the condition of its library." □

Campaign for the Third Century of Harvard Medicine



The Campaign reached $179.3 million in gifts and commitments as of May 31, 1991. The Campaign goal is $185 million.

BOOK MARKS

Filial Devotion

FIRST A DREAM: THE HISTORY OF BOSTON'S JEWISH HOSPITALS, 1896 TO 1928 by Arthur J. Linenthal, Beth Israel Hospital in association with the Francis A. Countway Library of Medicine, Boston, 1990.

by J. Gordon Scannell

Motivated by appropriate filial devotion, Arthur Linenthal '41 fifty years ago found himself caught up in the history of Jewish hospitals in Boston. This book is the result: first is the story of the Mt. Sinai Hospital from 1902 to 1917, a dispensary in the West End; then the development of the Beth Israel Hospital 1917 to 1928, the year the present Beth Israel opened.

Linenthal begins with an excellent discussion of the major demographic changes in Boston at the turn of the century, when thousands of Eastern European Jews, fleeing persecution, joined an established Jewish minority. Very quickly they perceived the need for a hospital where their language and customs could be understood and respected; not that Jews were turned away from other secular or religious-based hospitals, but in these, the press of affairs meant that Orthodox rituals, such as food and death rituals, and language were not easily understood.

Linenthal names a number of the established Jewish individuals in the Boston community who took their charitable responsibilities seriously in an effort to remedy this social need. Standing prominently among them in his ecumenical role was Richard Cabot, MD, with his deep understanding of the social needs of patients, particularly patients with tuberculosis—a major public health problem in the immigrant population of the inner cities. Later in the book, a section devoted to the extraordinary career of the author's father, Harry Linenthal '04, provides another superb picture of the domestic aspects of this disease and its special connotations.

The first efforts were directed toward the West End, at the turn of the century a closely knit, Jewish community, which many older HMS alumni remember from their days on the Boston Lying-In, McLean Street district, and Lewis Thomas's, Class of '37, memorable ballad, *Allen Street.* The old West End was totally obliterated by urban development after World War II, but in the days of Linenthal's book it was a crowded, immigrant neighborhood with a soul of its own.

First came the Mt. Sinai Hospital, dispensary in nature, which relied on the nearby Massachusetts General Hospital for inpatient care. Virtually all care was free, and what few charges there were would hardly meet current fares on the MBTA.

The first Mt. Sinai Hospital in 1902 was a storefront on Chambers Street. The following year, in response to the need for more room, it was moved to nearby Staniford Street. Its most intensive program centered on tuberculosis, but in spite of the nearness of Richard Cabot at the MGH, it was 1912 before Mt. Sinai developed its own social service department. In addition to TBC, its medical targets were lues, tumors, osteomyelitis and trauma.

From the beginning, the need for something more than an outpatient dispensary was apparent to the Federated Jewish Charities and allied groups, but action stalled in debates over providing interpreters, ancillary personnel, purchasing services in established inpatient hospitals, and etc., in lieu of a freestanding Jewish hospital.

In 1911 the Beth Israel Hospital Association was formed—initially allied to, but later independent of, the Federated Jewish Charities. The association recruited a professional staff largely from the Boston City Hospital and the MGH, arranged an affiliation with both Tufts and Harvard medical schools, conducted a fund drive on the order of $100,000 (which succeeded after a spluttering start), renovated a large frame building on Townsend Street in Roxbury, and in February 1917 opened the doors of the Beth Israel Hospital. The Mt. Sinai had folded the previous year.

Opening as it did just before the United States's entry into World War I, the Beth Israel experienced some staff instability during its first two years, as many of its physicians and surgeons went off to war. But the institution was busy, its medical staff competent and highly respected, so that its growth as a medical resource was assured. As early as 1919 it became apparent that it was time to work toward a modern hospital plant situated close to a major medical school, in this case Harvard and what has come to be known as the Longwood Medical Area.

The phenomenal growth of the Beth Israel during the affluent 1920s is recounted in some detail, probably more than the general reader requires. It is well organized, however, its documentation sequestered in 130 pages of well-written notes at the end, plus a number of appendices so that the narrative flow of the main text is smooth. Of particular note are five biographical chapters devoted to Beth Israel "greats": Miss Ethel Cohen (social service), Herman Blumgart '21, Monroe Schlesinger '26, Charles Wilensky, MD and Harry Linenthal '04.

The chapter devoted to Linenthal is especially compelling. Born in a small Russian town in 1876, he came to Boston with his parents in 1891. His formal schooling began thereafter—English High School, Harvard College, Harvard Medical School. Starting practice as a family physician, he became involved in the Jewish hospital movement, pioneered in abnormal psychology, public health, tuberculosis and industrial medicine. In 1913 he became the first Jewish physician appointed to the staff of the MGH, and in 1928 he was appointed Beth Israel's first physician-in-chief. Written with an eye for detail and style, the account of Linenthal's career is an absorbing essay on Boston medicine and sociology in the first three decades of this century.

There the narrative part of this history ends, with a short afterword of just a few pages to bring us up to the thriving enterprise of the Beth Israel today. Arthur Linenthal's filial devotion has paid dividends. □

J. Gordon Scannell '40 is clinical professor of surgery, emeritus, *and editor of the* Harvard Medical Alumni Bulletin.

FROM DISCOVERY TO RECOVERY

A Physician's Story of Addiction

by Frank Speaker

From the time I was a child, until 12 years ago when I took my last mood-altering chemical, I had a recurring dream—a dream that I could fly. In that vivid dream, I would put my head down, run as hard and as fast as I could, and then leap into the air, only to fall quickly to the ground. I then would get up, dust myself off, and repeat the maneuver, pushing myself even harder, running even faster. Finally, on perhaps the third or fourth try, I would lift free of whatever was holding me back and begin soaring above the trees and houses of our town. Looking back now, I realize that dream was a clear metaphor for my life.

Although I have aunts and uncles who are alcoholics, I was raised in a loving home that was, essentially, free of alcohol. Despite that caring, protective environment—or perhaps in some ways *because* of it—I grew up with a value system centered not so much around right and wrong as around approval/disapproval. I never had a sense of myself as a unique and valuable individual—never understood that the reason I got up each day should have been to be happy and to grow as a person.

Instead, I constantly sought self-validation through the adulation of others—the trophies of an all-star athlete, the applause for leading (always) theatrical performances, the pieces of paper for academic excellence. But all the while, as I piled up more achievements—acceptance to a top college, president of my fraternity, varsity athlete, honors grades—and developed more "interests"—expertise at bridge, skill on several musical instruments, more theatrical roles—a deep, black hole was widening inside me, a hole that swallowed feelings, a hole of *dis-ease*.

Despite my many actual accomplishments, I still carefully orchestrated what I said to people and did around them. I constantly strived to create a certain impression in others, often embellishing stories about myself, attributing accomplishments that never happened. Throughout those years, I was consumed by fears that I would be found out to be what I really perceived myself to be—a fraud, a person without worth.

It is this lack of a sense of self—this spiritual bankruptcy, if you will—that I now know is the predisposition to many forms of excess, including over-

ILLUSTRATION BY JAMES KACZMAN


Kaczmarek

eating, overworking, promiscuity, pathological gambling, alcohol consumption and drug-taking. In other words, I was already an "addictive" person, merely waiting for contact with the activity or substance through which that addiction—that means of (temporarily) filling the black hole—would best be manifest.

Throughout high school and college, I never drank for fear of what others would see of me if I got drunk and lost control. I chose to be pre-med, I now believe, because of my insecurities. Studying harder than anyone else and getting good grades was no great problem, and medicine seemed like the profession that would gain me the most respect and adulation. I had many other stories I would tell (depending on what I thought the listener wanted to hear), but in truth my reasons for becoming a doctor were no more profound than that. I should mention here that I am certain my choice of medicine as a career was a right one for me, but I am equally certain that it was a case of doing the right thing for the wrong reasons.

I was the first in my class at college to be accepted into medical school. At age 21, during the summer between my graduation from college and my first year at medical school, I got married. I also began drinking. And from day one, my drinking pattern was alcoholic.

As my awards and successes mounted, my feelings of inadequacy and self-deprecation continued to deepen.

I didn't drink all of the time, but when I did, I invariably got drunk. And incredibly, when I drank, most of my feelings of fear, insecurity and self-loathing disappeared. The black hole within me was at last filled. I could be a good and open friend, a relaxed, confident lover.

Throughout med school, I worked hard at my studies all week—at least as hard as anyone in my class—and carried anywhere from one to three outside jobs as well. Still, on most weekends I found time to drink, and more often than not ended up sick or unconscious when I did. If asked to describe myself at that time, I would have said something like that I was a "hard drivin', hard workin', hard drinkin' son-of-a-gun—a man with great appetites and a great passion for life." I certainly had no sense that more accurately, I was a garden variety drunk in the early stages of a serious, life-threatening illness.

After graduating from medical school with honors, I bundled my wife and children off to begin my training in internal medicine. As my awards and successes mounted, my feelings of inadequacy and self-deprecation continued to deepen. I took two years off in the middle of my training to do my military service as an officer in the U.S. Public Health Service, working as a biochemist. At night I moonlighted in various emergency wards.

In addition to my day and night jobs (and sadly, given that I had a wife and two small children at the time), I co-founded and became medical director of a free clinic—soon to become the largest, most successful facility of its kind in the country. I had my own weekly television show—primarily

Turning Point: A Contract for Help

Bernard Levy doesn't use the word "impairment" when he talks about physicians with alcohol and substance abuse problems. "Impairment—when the quality of medical care is affected—is a late outcome of this disease and is uncommon," says Levy, a psychiatrist who is chairman and co-founder of the Massachusetts Medical Society's Committee on Physician Health. "As with any disease, the whole idea is to catch the problem early on."

The Mass. Medical Society's program for rehabilitating physicians with alcohol and substance abuse problems (chemical dependency is now the preferred term) is 12 years old, one of the earliest state programs. Now every state has some kind of program, says Levy, although there is no universal method: "Most of this is grass roots—50 points of light!"

There is a lifetime prevalence of substance abuse in 3–6 percent of the general population, says Levy, who believes that physician use reflects the same pattern. Some of the drugs used are different, however, and one that is particularly addictive, fentanyl, has been abused by anesthesiologists, who have access to it.

Of particular concern to Levy is that spouses or partners know that there is a place to turn to for confidential help. "They learn that chemical dependency is a treatable disease and that good people have it. This is not the end of the world. But it *is* a threat to a physician's well-being."

Rigorous, careful monitoring by another physician is a hallmark of Mass. Medical Society's program. Though a chemically dependent physician is asked to stop practicing until he or she has been in recovery for 60 to 90 days, there is no revocation of license in Massachusetts, and the Board of Registration is not notified at all unless the physician relapses. Once into recovery, the physician signs a contract, which requires:

- treatment by a physician for the chemical dependency;
- participation in Alcoholics Anonymous, Narcotics Anonymous or some other peer group meetings of recovering physicians;
- notification of the physician's chief of service, who is then asked to provide reports to the committee;
- for physicians with alcohol dependency, a daily monitor at the workplace;
- urine drug screens twice a week initially and weekly random screens thereafter.

"Everyone starts by denying that they have a problem," says Levy. "So the first step toward recovery is not necessarily to recognize a problem. Many people start

dedicated to teaching young people about the dangers of drugs! My work was featured on many television news programs, and was written up in various national magazines. I was featured in an article on the "new healers" in *Time*.

My personal life—marital and financial—was coming unglued, but to the outside world I was something of a hero. The director of the President's Council on Drug Abuse frequently called me for advice and offered me a position on the council. Now, my feelings of being a sham were beginning to dominate my life. I allowed myself to balloon to 240 pounds (I weigh 190 now), began drinking during the week, and kept moving almost incessantly from one civic activity or banquet speaking engagement to another.

At age 29, with only one year of residency and no other formal training, I was offered the position of health commissioner of the large city where I was working. In an effort to save my crumbling marriage, I turned the job down and returned to my medical residency. Within six months, though, I was separated from my wife, on a self-imposed six-week leave of absence from work, living in a dingy one-room apartment, drinking excessively, and taking self-prescribed Valium to combat a mounting depression.

If I could not get myself straightened out, how could I think anyone else could.

Struggling to stay afloat, with an immense effort I was able to curtail much of my drinking and tranquilizer-taking and finish my internal medicine training (although I did decide not to enter the cardiology fellowship to which I had been accepted). Instead, after becoming board-certified in internal medicine, I moved alone to join a small group practice.

Very quickly my practice became my life and, if you will, my drug of choice. With no family to go home to, I often spent the night in the ICU when I had a particularly critical patient. I came to the ER to see my patients late at night, even when I wasn't on call. When I wasn't working, I was studying medicine or driving the 150-mile round trip (usually twice in a weekend) to spend time with my children. It was a frantic, frantic existence.

Within two years, I was chief of medicine at my hospital and my practice was full to overflowing. Unable to say "no" to anyone, I kept allowing more patients into the practice, and simply cranked myself up to work more hours. Gradually, I began taking stimulants to get going in the morning and sedatives to slow down at night. Joint pains, headaches and other symptoms developed, for which I self-medicated with codeine and other narcotics. On those few days off when I had no responsibilities for my children, I drank.

Never that I remember did I think about getting help. For one thing, I was in complete denial that I had any serious problem. And for another, I was told over and over again by professors and the public that I was the ultimate authority—the highest power, if you will. If I could not get myself straightened out, how could I think anyone else could.

More and more I blamed persons, places and things for the internal troubles I was having. From time to time I would simply rationalize taking a drug

---

off by saying 'Well, I don't think I have a problem, but my friends, wife or whomever say I do'." The first step ideally should be for the spouse or the physician with the problem to go to the physician's own doctor to get treatment under way. The committee and one of their 30 volunteer physicians become involved if there is a need for outside monitors.

Throughout its 12-year history, the committee has helped 275 physicians, including a few medical students. It is monitoring 107 physicians now. Levy claims that their total success rate is 90-something percent: success with alcohol dependency is somewhat less, but with drugs it is almost 100 percent. "For most, the realization that they might lose their practice is a powerful deterrent to having that one more."

Levy doesn't believe the hypothesis advocated by some experts that the psychodynamics leading people to a career in medicine might predispose them to addiction—such characteristics as compulsiveness, conscientiousness, control over emotions and delays of gratification. Levy argues that there are many reasons for chemical dependence and everybody is different. The one common denominator he has found among those with addictions is that they drank or used other chemical substances in their high school/college years. (This isn't necessarily true for those who are addicted to cocaine or iatrogenic narcotics, such as those used for back pain.)

"There is a lot we don't know because this is a brand new field," he says. "It is where epilepsy was 50 years ago or where pneumonia was before penicillin. For example, we are just beginning to understand the impact on children of dysfunctional families, children whose sense of self was destroyed and thus feel they need a chemical."

He doesn't believe that society is investing in children as it should. "If I had to say what's behind chemical dependence, it is society's lack of respect for kids."

Stress plays a role, but "I think welfare mothers have more stresses than medical students or physicians." He points to Lee Robins's study of heroin use among Vietnam veterans. Twenty percent of the veterans used heroin in Vietnam, but most gave it up when they returned home; less than 1 percent remained addicted. "A certain percentage of people have a tendency to addiction."

There is less shame these days in admitting to a problem. "Very simply," sums up Levy, "there is an epidemic of drug abuse and some physicians are affected by it." □

—Ellen Barlow

by saying to myself, "I work so hard, I give so much to others, I deserve to feel good just for a little while." Usually, my drug-taking was at night, but sometimes it was during the day. I was never aware of my addiction affecting the way I practiced medicine, although it must have in some ways. To the best of my knowledge there were no more complaints than other physicians encounter, and probably much less.

I obtained the drugs I used by ordering them from wholesale houses, or sometimes from writing prescriptions for nonexistent patients and filling them myself. I was always very clumsy about the way I obtained the drugs, suggesting to me, at least, that I was crying out for help.

Eventually, as they say, I began settling for less. I left my practice and worked for a time as a cruise ship doctor. Then I worked at a number of "doc-in-the-box" shopping mall clinics. I spent a month as a patient in a psychiatric hospital, but was told by the doctors there exactly what I wanted to hear: that I drank and took chemicals because I was depressed and my life was unmanageable. It was not until I entered recovery that I was told I might be depressed and my life might be unmanageable *because* I took drugs and drank.

In 1979 I was confronted by an employer with prescriptions I had written for nonexistent patients, and was fired. Over the week that followed, my depression deepened and I came perilously close to suicide. Finally, at virtually the last possible moment, a group of physicians who had overcome problems similar to mine contacted me and started me on the road to recovery.

I met with the Board of Registration in Medicine in my state and surrendered my narcotic-writing privileges (for two years) in exchange for not losing my medical license. I then entered into a monitoring contract with my state medical society's physician health committee and began doing volunteer work at an inner-city clinic. For a year I lived off a small disability insurance policy. Now, after five years as a member, I am considering becoming chairman of that medical society committee.

After nearly a year I reentered medicine as an emergency physician. Now it has been 12 years since I last took a mood-altering chemical. I remain active in Alcoholics Anonymous and other peer support activities, and have slain many, though certainly not all, of my dragons of insecurity and self-doubt. But in the main, my life now is peaceful, full, balanced and imbued with a sense of God.

The key to my continued recovery and growth as a person lies, I believe, in constant vigilance and in service. My work with physicians who have substance abuse problems is both rewarding and therapeutic, and although I no longer place saving the world above sharing life with my family, I remain committed to helping others in recovery when I can.

There is no sin whatsoever in a physician being sick—whether it be diabetes, heart disease, alcoholism, drug addiction or any other illness. The sin lies in not seeking help. □

In keeping with the Alcoholics Anonymous tradition of anonymity at the level of press, radio and television, Frank Speaker, MD is not the author's real name.

HMS Students to Initiate Peer Counseling

Prevention being the best medicine, Harvard Medical students are establishing a peer counseling drop-in center. Through peer counseling, workshops and posting faculty resource lists, the students' Committee for Student Health hopes to help their classmates deal with anxiety and anger, and recognize eating disorders and alcohol and drug problems before they turn more serious.

Chantal Caviness '93 and Joe Califano '93 initiated the committee last year, spurred on by a lecturer—during a day of Pharmacology block devoted to chemical dependency—who asked if anyone was interested in forming a program to assist students with alcohol and drug problems. About 20 other medical schools around the country have programs based on one started at the University of Tennessee/Memphis in 1983, called Aid to Impaired Medical Students (AIMS). After investigating what other schools were doing, Caviness and Califano got other students involved, Vanessa Smith '94 and Peter Hatcher '94.

They decided first to survey first- and second-year students to see whether drugs and alcohol were perceived as problems, or if other problems took precedence. The results showed that depression and anxiety were of more concern, although about 31 percent of the students who responded felt that alcohol was a problem among medical students and about 13 percent felt that drugs were.

"Our first goal had been to target chemical dependency," says Smith, "but when we saw what students perceived to be problems, our aim became more preventive." Clearly the students did not want a program that involved the administration and notification of the dean, says Caveness, who added: "We like to think of this as a carrot rather than a stick approach."

Based on their findings, they decided that HMS might benefit most from a drop-in center staffed by students trained in how to listen and refer appropriately. They hope to have a lounge in Vanderbilt, staffed five nights a week, starting in the fall of 1991. Lists of Harvard and non-Harvard faculty willing to talk to students have been available for some years, but now will be posted and more widely distributed.

"Our objective is to help students deal with the impact of medical school on their lives as well as the impact of their lives on medical school," says Smith.

Independently, Edward Hundert '84, associate dean for student affairs, has been developing a plan to augment the role of the Vanderbilt house officers to include peer counseling and referral in addition to handling more routine housing matters. Ideally he'd like there to be a feeling of support from day one of medical school. "I'd like to see every arriving student greeted by a member of the Committee for Student Health to help carry in their luggage and then be met by their house officer, who helps them unpack." Peer support groups—started over 10 years ago by now retired Dean for Student Affairs Carola Eisenberg—will also continue. □

—E.B.

PHOTOS COURTESY OF RARE BOOKS, COUNTWAY LIBRARY

William S. Halsted

Idiosyncrasies of a Surgical Legend

by Sherwin B. Nuland

Late on the afternoon of the third Friday in November 1983, a busload of muscular Harvard undergraduates journeyed to New Haven, Connecticut to engage an equivalent number of Yale stalwarts in a game of football the following day. This being the hundredth encounter between two schools whose gridiron rivalry has been so instrumental in the growth of American collegiate athletics, the accompanying hullabaloo was often deafening to listen to and blinding to read about. For days beforehand, the names of legendary stars, captains and coaches of yesteryear filled the sports columns of newspapers in most cities of the Northeast. Even Handsome Dan, the Yale bulldog, was biographed in all of his incarnations.

On December 6, 1873, two years before that much-sung inaugural contest, Yale had fielded this country's first eleven-man football team, against a pickup group of Englishmen who called themselves Eton College. The modern gridiron sport that transfixes millions of Americans every autumn weekend has evolved from the rules used in that encounter. Forgotten in the festivities of a century later was the name of the captain of the victorious Yale eleven. He was William Stewart Halsted, a twenty-one-year-old senior from New York City.

The sturdily built young athlete was an indifferent student; his scholastic achievements would be magnified if they were called ordinary. After much searching, one of his biographers was forced to conclude, "The Yale Library has no record of his having borrowed any books." Having prepared at Andover in the same desultory way, Halsted was, like so many of his cronies, interested in athletics to the exclusion of the more cerebral activities

William Stewart Halsted operating in 1904.

which were meant to characterize Ivy League student life. Photographs taken of him at that time show a faultlessly tailored, handsome (albeit somewhat jug-eared) dandy looking every bit the rich man's son that he was.

The father of this combination of Beau Brummel and Frank Merriwell was the president of Halsted, Haines and Co., a family-owned textile-importing firm founded near the turn of the nineteenth century. The elder Halsted was descended from an ancestor who had settled in Hempstead, Long Island in 1660. For a marriage partner, he had chosen his cousin, Mary Louisa Haines, herself descended from impeccable ancestors.

Some species of medical magi must surely have journeyed to the distinctly unmanger-like precincts of the Halsted mansion, there to deliver to the silver-spooned babe the delayed-action gifts that would be unwrapped only after the completion of his unedifying years at Yale. If ever a deep-rooted plant bloomed late, it was this white-spatted, bowlered, cravated flower of the Ivy League, whose do-not-open-till-medical-school talents were never so much as suspected until almost too late. To pursue the botanical metaphor to a logically florid, but quite accurate, end point, when the petals of his intellect finally opened, they exposed pollen enough to inseminate the entire fallow field which was then American surgery. What grew thereafter was a new spirit, a new technique, and a completely original sense of leadership. An adjective was coined to describe it: it was called Halstedian.

Halsted reached manhood at a particularly propitious time in the history of American medicine. The majority of home-grown physicians were still obtaining most of their education in the old apprenticeship system, with the usual addition of a three-to-four month session during each of two years at one of the predominantly doctor-owned medical schools. Those few students who could afford more advanced training went off to Europe in the time-honored way. In the young Halsted's day, it was usually in Germany and Austria that they found their efforts best rewarded. Even the rudiments of scientific medicine remained unfamiliar to most aspiring physicians who missed the European experience. The only exception were those who could pick it up secondhand from colleagues or journals.

American medical education had to have a change of venue—out of the doctor-owned proprietary schools and into the scholarly atmosphere of the universities.

The model was to be the German system, and its prototype in the United States would be the Johns Hopkins Medical School in Baltimore. It was the destiny of William Halsted that he would become the first professor of surgery at this first American college of medicine that was truly a university graduate school. That the opportunity came to him was the shiny lining of a dark cloud, the consequence of a series of events that skimmed the cusp of personal tragedy like a tangent, and then soared off toward that tiny greensward reserved for the immortals of medical history. The William Stewart Halsted so luxuriously swaddled in his family's Manhattan town house on that late September morning in 1852 survived a fall from grace in his mid-thirties that brought him to near-ruin. He regenerated himself to become the man rightfully remembered as the father of American surgery.

In the autumn of 1874 William Halsted enrolled as a medical student at the College of Physicians and Surgeons in New York, where his influential father was a member of the board of trustees. Although officially designated as the Medical Department of Columbia University, the school was in reality a completely autonomous institution. It was, in fact, owned by members of the faculty, as were all of the eight medical schools in New York at that time.

Halsted's preceptor was Professor of Anatomy Henry B. Sands, who in 1879 was to become Professor of the

Practice of Surgery. As fortunate as was his choice of preceptor, Halsted was blessed with an additional bit of luck by becoming student assistant to the author of his physiology text, John C. Dalton. He not only completed the three-year course, but apparently underwent a scholastic metamorphosis as well: he was awarded the MD degree with honors and he was among the top ten men in his class.

Internship in those days could be embarked upon before the formal granting of the doctorate. Halsted's, at Bellevue Hospital, began in October 1876, and continued for an eighteen-month period. Subsequently, he served as house physician to the New York Hospital from July to October 1878.

When his service at the New York Hospital ended, Halsted embarked on a steamer for a two-year period of study in Europe. On November 4, 1878 the young physician arrived in Vienna, where he studied until the following spring. Most of his two years were spent visiting and working at the great German-speaking clinics, the world's leading centers of medical science.

As we read Halsted's descriptions of his two European years, it is apparent that they formed the foundation of the approach that he would take to clinical investigation for the rest of his life. Although he would found a distinctly American school of surgery, he remained German-influenced to the end of his days, or as his colleague William Osler put it, "very much *verdeutsched*."

Halsted returned to New York in September 1880. The depth and variety of his European experiences, as well as his own obvious abilities, combined to make him one of the most highly regarded young surgeons in the city. In recognition of his talents, his enthusiasm, and, it must be admitted, his connections, numerous opportunities came his way. He seems to have refused none of them.

The capable young surgeon became Demonstrator of Anatomy at the College of Physicians and Surgeons. He accepted Dr. Sands' offer of an association with him in surgical practice at the Roosevelt Hospital, where he later founded the Outpatient Department.

In 1881, he was appointed Visiting Physician to the Charity Hospital, a large public institution on Blackwell's Island. Although his rounds were intended to be medical, the hospital's interns were so taken with his skills that whenever they could do so they declared waiting elective surgical procedures to be emergencies so that they could assist him in the operating room during his evening visits. In 1883, he added to his duties the position of Consulting Surgeon to the New York State Emigrant Hospital on Ward's Island, another obligation reserved for evenings. In that same year he became Visiting Surgeon to Bellevue Hospital, where he formed a strong bond of friendship with fellow Yale alumnus, the German-trained pathologist William Welch. He was also named Attending Surgeon at the Chambers Street Hospital, an institution reserved for the treatment of emergencies. To this long list he added, toward the end of his New York period, the title of Visiting Surgeon to the Presbyterian Hospital. He was busy, he seemed happy, and he quickly acquired a reputation as an exciting and venturesome surgeon and a leader in the medical life of New York City.

In the case of William Halsted, the funeral pyre was powdered with cocaine.

One episode in particular epitomized Halsted's role in promulgating the doctrine of germ-free surgery among his reluctant colleagues. Like most American physicians, the surgeons of New York were skeptical of Listerian principles, and of the theory that wound infections are caused by bacteria.

Soon after he accepted his appointment to Bellevue Hospital, it became apparent to Halsted that proper sterile technique was an impossibility in the institution's operating rooms. Having become convinced by his European experience of the need for asepsis, he refused to do surgery under less than perfect circumstances. With help from some of his many friends, he raised $10,000 to erect in an enclosure on the hospital grounds a huge tent to serve as his personal operating pavilion.

During the New York years of 1883–1886, Halsted published or presented a total of twenty-one scientific papers, on a variety of topics. His first publication already revealed a certain prescience. Titled: "Refusion in the Treatment of Carbonic Oxide Poisoning" it is significant also because it has been all but forgotten among Halsted's later great contributions that he was one of the earliest proponents of direct blood transfusion.

And now to the fall—or rather, to the phoenix. The legendary Egyptian phoenix was a male bird of exceptionally gorgeous plumage, a characteristic shared by the subject of our story. By himself, this bird is said to have built and set fire to the funeral pyre upon which he then died, and from whose ashes he later arose reborn. The tale of the phoenix is the stuff of the classic resurrection story, found in mythology, scripture, and in the biographies of men and women every day. It has many variations, ranging from the rebirth of nations to a modified modern pop form in which it is called the midlife crisis. In the case of William Halsted, the funeral pyre was powdered with cocaine.

Cocaine too is the subject of legends. The story of its first applications to the art of healing, in fact, has been embellished to the point where the accuracy of each detail has now or then been questioned. What follows is a brief outline of what is thought to be true.

There are few sudden breakthroughs in the progress of medical science. Rarely can a single date be pointed out as the distinct time of origin of anything. And yet, as uncommon as such landmark scientific birthdays have been, the history of anesthesia claims two of them. The first occurred on October 16, 1846, when William Thomas Green Morton induced the first public demonstration of ether surgical sleep at the Massachusetts General Hospital. The second took place on September 15, 1884, when at the Heidelberg meeting of the German Ophthalmological Society, Dr. Josef Brettauer read a paper by a twenty-six-year-old junior faculty member of the Vienna Medical School who could not afford the costs of traveling personally to present his own work. The impecunious researcher was Dr. Karl Koller, and his startling paper described a brief series of experiments done during several weeks that summer in which it was demonstrated that the surface of the eye could be anesthetized by the application of a few drops of cocaine, an alkaloid extracted from the American coca leaf, *Erythroxylon coca*.

Since 1862, the drug had been

known to produce numbing of the oral mucous membrane (of course, the Peruvian Indians had been aware of this for centuries) but no real work had been done with it for almost two decades. Then a twenty-eight-year-old neurologist in Vienna, one Sigmund Freud, began some experiments to determine its effect on the central nervous system. It was at Freud's suggestion that his friend Koller began his own cocaine study.

The news of the discovery of cocaine's local anesthetic effects was hailed throughout the surgical world, and experiments were immediately begun in a number of the great European centers. In Koller's own hospital, Halsted's old friend Anton Wölfler undertook an investigation to determine the drug's usefulness in general surgery. Whether by personal correspondence or by a report of the Heidelberg meeting that appeared in the *Medical Record* of October 11, 1884, Halsted was influenced to begin his own series of experiments. He enlisted a small group of his colleagues, as well as a number of medical students, and did work on local infiltration techniques as well as methods of blocking major nerve trunks. The group's experimental subjects were themselves and each other.

In the course of their work, the young researchers became aware of the exhilarating effects of the drug. Innocent of its addictive qualities, which were as yet unknown, some of them took to sniffing cocaine powder to enhance social experiences. With a few snorts, the most boring evening at the theater became a histrionic extravaganza. Friends were invited home for demonstrations; would-be participants in the research had to be turned away.

Halsted and his associates held high hopes, in more ways than one, for their investigations, but the personal cost soon became obvious. Several of them became addicted, including their leader. In spite of having accumulated a great deal of data, Halsted published only one paper on cocaine, a short article in the *New York Medical Journal* in September 1885. Written while his addiction was at its worst, it contrasts markedly, and frighteningly, with the clarity and precision of all of his other writing. A glance at the first sentence will illustrate the degree to which he had deteriorated, and also explains why no further cocaine publications were forthcoming:

> Neither indifferent as to which of how many possibilities may best explain, nor yet at a loss to comprehend, why surgeons have, and that so many, quite without discredit, could have exhibited scarcely any interest in what, as a local anaesthetic, had been supposed, if not declared, by most so very sure to prove, especially to them, attractive, still I do not think that this circumstance, or some sense of obligation to rescue fragmentary reputation for surgeons rather than the belief that an opportunity existed for assisting others to an appreciable extent, induced me, several months ago, to write on the subject in hand the greater part of a somewhat comprehensible paper, which poor health disinclined me to complete.

He eventually was able to appear as more a complicated eccentric than a furtive fugitive from an ever-lurking need.

Of the small group of young physicians who became cocaine-addicted, all but Halsted were eventually destroyed by it, professionally and personally. For Halsted, the onset of cocaine dependency began a lifelong battle against despair and ruin that threatened the disintegration of his career as long as he drew breath. Every one of the golden blocks of accomplishment that made up the monument of his later fame was put into place while he was under a spell, first of cocaine and then of morphine.

Although he was never able to unfetter himself of his dependency on drugs, Halsted did manage to loosen the stranglehold in which they at first gripped him. He eventually became sufficiently free that he was able to work, to think more clearly almost always, and to appear to unknowing associates as more a complicated eccentric than a furtive fugitive from an ever-lurking need. In this sense he won out over his addiction.

After his move to Baltimore, even those who were aware of his New York collapse seem to have believed that its effects were long behind him. Those who knew better kept his secret; they did not even speak of it among themselves. White lies were told, explaining away as the idiosyncrasies of a brilliant introvert his frequent bits of inappropriate behavior, his solitary annual trips to small European hotels, and his many episodes of either leaving the hospital abruptly in the midst of an urgent schedule or absenting himself entirely. What remained unspoken was the most obvious fact of all: an intrepid, even audacious young surgeon, whose career had hurtled relentlessly along the high road of personal and professional success in New York, arrived in Baltimore metamorphosed into a remote, ploddingly cautious, compulsive researcher whose earlier exhilarating instruction of students had turned lackluster, and whose greatest satisfaction seemed to come from the slow, meticulous accumulation of scientific evidence in the laboratory.

Even beyond the grave, the few loyal friends who knew the full magnitude of Halsted's secret strove zealously to guard it from disclosure. In trying to save his reputation, however, those well-meaning advocates actually did him a disservice. After the full truth became known, almost half a century after his death, Halsted's name shone more brightly than ever as an example of indomitable courage and the strength that can sometimes be marshaled by the human spirit.

For much of the information on Halsted's habit that appears in the following paragraphs, I am indebted to the excellent studies of Professor Peter Olch of the Armed Forces University of the Health Sciences. I found some of the rest of what I am about to describe in Yale's collection of the unpublished letters of Harvey Cushing, founder of the specialty of neurosurgery and Halsted's most celebrated disciple. The remainder was extracted from the contents of a small locked black book, written by the first Professor of Medicine at Johns Hopkins, William Osler, and not opened until 1969. Osler, not only the finest teacher of medicine this continent has ever produced but also one of its most talented chroniclers, titled a part of the book "The Inner History of the Johns Hopkins Hospital." In it he revealed how he discovered, soon after Halsted's appointment to the Hopkins Chair of Surgery, that his colleague was taking large amounts of morphine. Very probably, he had begun using it during his attempts to break the cocaine habit, at least it inter-

fered less disastrously with his life than did cocaine. Here is Osler:

> The proneness to seclusion, the slight peculiarities amounting to eccentricities at times (which to his old friends in New York seemed more strange than to us), were the only outward traces of the daily battle through which this brave fellow lived for years. When we recommended him as full surgeon to the Hospital in 1890, I believed, and Welch did too, that he was no longer addicted to morphia. He had worked so well and so energetically that it did not seem possible that he could take the drug and do so much.
>
> About six months after the full position had been given, I saw him in a severe chill, and this was the first intimation I had that he was still taking morphia. Subsequently I had many talks about it and gained his full confidence. He had never been able to reduce the amount to less than three grains daily; on this he could do his work comfortably and maintain his excellent physical vigor (for he was a very muscular fellow). I do not think that anyone suspected him, not even Welch.

It was due to the efforts of William Welch, in fact, that Halsted was able to reconstitute the fragments of his career. By the time of Halsted's collapse, the Bellevue pathologist had moved to Baltimore to take part in the final planning for the opening of the Johns Hopkins Hospital. When he realized how disabled his friend was, he went back to New York, convinced him to go off on what he hoped would be a therapeutic sailing trip to the Windward Isles, and personally hired a schooner for the purpose. The cruise, taken during February and March of 1886, was a disaster. Among Cushing's collected letters in the Yale library there is a brief note dated December 5, 1930, by John Fulton describing a conversation he had had that day with the by then retired neurosurgeon. Cushing told him that Halsted took with him "enough cocaine to last him for all but the last two weeks of voyage." Fulton's note continues:

> Could he break his addiction? No. He broke into the ship's drug store and continued the habit until the end of his life. . . . Harvey Cushing also told me this today, said that in fifteen years he was with Halsted (in his home only twice in that time!) he never suspected the cocaine habit, and only with difficulty was he led to accredit it years later.

The Four Doctors *by John Singer Sargent; W.H. Welch, W.S. Halsted, William Osler, H.A. Kelly.*

When Halsted returned home, he forced himself to come to grips with the fact that he would never break his addiction without some form of treatment, and admitted himself to the Butler Hospital, a private psychiatric facility in Providence, to attempt a cure. When he was discharged in November 1886, he acceded to Welch's wish that he come to Baltimore so that he could remain under his nurturing care as well as his watchful eye. Arriving at Hopkins the following month, he began to work in the laboratory with the anatomist Franklin P. Mall on an experimental study of intestinal suture methods. However well those researches may have gone, it became clear by early spring that Halsted's attempts at recovery were once again failing. On April 5, 1887, he was readmitted to Butler Hospital, where he remained until he returned to the laboratory in January 1888. It was almost certainly during one of his Butler admissions that he began to use morphine, but it is only conjectural whether it was begun as part of his treatment or whether be bribed someone to smuggle it in to him.

Thus, though he was probably cocaine-free after settling in Baltimore, Halsted remained morphine-addicted the rest of his life. He was brought to Hopkins not to become a Professor of Surgery, but rather to pull together the shattered bits of his life. It was Welch's intention that he begin in the laboratory, and that he not stray from his own supervisory big-brother eye. The convalescent moved into the boarding-house in which Welch rented rooms, and started on his research, which Peter Olch most appropriately calls "a form of occupational therapy" and most certainly not an academic appointment.

Before long, it became obvious to those who knew of his work in the various Baltimore hospitals that he was a highly skilled surgeon. William Macewen of Glasgow having refused the offer of a professorship, the hospital approached its opening without a chief of surgery. Taking a chance, almost certainly at the strong urging of

Welch and Mall, the trustees appointed Halsted surgeon *pro tempore* in February 1889, and Surgeon-in-Chief to the outpatient clinic. Shortly thereafter, he was made an associate professor at the medical school, and two years later Halsted was named Professor of Surgery and Surgeon-in-Chief to the Johns Hopkins Hospital.

What Halsted accomplished during his thirty-year tenure may be seen as a series of contributions that developed along three lines, each of which was a replacement of an outmoded approach. The first was a new method of training surgeons that replaced the old haphazardness of assisting a professor for endless years, putting in its stead a graduated system of increasingly complex responsibility; the second was an approach to surgical operations that replaced the flashiness of his predecessors' smash-and-grab technique with caution, gentleness, and accurate anatomical dissection; the third was the introduction of a group of new operations that replaced the mere carving away of the intrusive invading disease with procedures that were based on the principle of restoring normal physiology.

The gentle, meticulous "Surgery of Safety" Halsted introduced became the distinctly American approach to operative craftsmanship.

In any consideration of Halsted's philosophy in matters of surgical technique, his work on groin or inguinal hernia stand out. Conceived on the careful application of his concepts, and utilizing his knowledge of both visible and microscopic anatomy, Halsted devised a hernia repair whose basic principles remain those used by all surgeons today.

Halsted made many advances in surgery of the thyroid, bile ducts, intestine and aneurysms of the arteries. Like all surgeons of his time, and all surgeons of today, he considered his most fearsome enemy to be cancer, particularly cancer of the breast. Even people who know very little else about modern scientific medicine seem to have heard of the Halsted radical mastectomy, and to have an opinion about it. Nothing, however, should take away from an appreciation of the impressive changes that Halsted's operation produced in the results of breast-cancer treatment in the decades after its introduction.

Because of their lucid narrative style, all of Halsted's papers read like literature. Sprinkled, albeit sparsely, throughout Halsted's writings are vignettes of personal experiences that give hints about his own life. One story, with a lasting impact on the world of surgery, is told in a 1913 review article on surgical technique. The following paragraph, dealing with the irritative effects of sterilizing solutions, appears midway through the paper:

> In the winter of 1889 and 1890—I cannot recall the month—the nurse in charge of my operating-room complained that the solutions of mercuric chloride produced a dermatitis of her arms and hands. As she was an unusually efficient woman, I gave the matter my consideration and one day in New York requested the Goodyear Rubber Company to make as an experiment two pair of thin rubber gloves with gauntlets. On trial these proved to be so satisfactory that additional gloves were ordered. In the autumn, on my return to town, an assistant who passed the instruments and threaded the needles was also provided with rubber gloves to wear at the operations. At first the operator wore them only when exploratory incisions into joints were made. After a time the assistants became so accustomed to working in gloves that they also wore them as operators and would remark that they seemed to be less expert with the bare hands than with the gloved hands.

This is very likely the most famous paragraph ever printed in the literature of surgery, not only for its description of the introduction of rubber operating gloves, but also because it is the only instance of the beginning of a researcher's love affair being recorded in a medical journal. That "unusually efficient woman" whose chemical rash had led to the use of surgical gloves was Caroline Hampton, who on June 4, 1890 became Mrs. William Stewart Halsted. It was a secure, mutually devoted marriage. In "The Inner History of the Johns Hopkins Hospital," Osler wrote of his colleague's marriage: "He married a woman after his own heart and, like himself . . . a little odd. They cared nothing for society, but were devoted to their dogs and horses."

High Hampton was Caroline's two-thousand-acre family estate (she too was of the American aristocracy, southern-style) in North Carolina. At the end of each academic year, the Halsteds would leave Baltimore for the summer. After a month in the cool mountain air at High Hampton, cultivating his dahlias and peering heavenward through his telescope, the professor would go off to Europe alone, secluding himself in expensive hotels for long periods, seeing no one. We will never know whether morphine was his roommate, but it is hard to believe otherwise.

One of the unhidden things Halsted did while on his annual trips abroad was to have himself outfitted in London and Paris. In respect to matters sartorial, he had not changed from his younger days. He dressed to perfection, and no American tailor satisfied him.

Cushing, who was a bit of a dandy himself, wrote that although Halsted's suits were tailored in London, his kid shoes were narrow in the French style "with a pointed although truncated toe." He personally selected the place on the hide from which the leather was to be cut, and ordered six pairs at a time from his Paris bootmaker. Any pair with which he was dissatisfied was discarded on arrival. His dress shirts were sent to a Paris laundry, Halsted claiming that he could find not a single shop in America that knew how to handle them properly. I am surely not the only person who has wondered whether the boxes of returned shirts also contained hidden vials of narcotic.

Halsted's *boulevardier* image belied his behavior. He was anything but jaunty; in this apparent *bon vivant* there was very little *bon* and even less *vivant*. Words like "animated," "lively," and their synonyms would be misplaced in any description of his Baltimore personality. He was diffident, distant, and almost inaccessible under ordinary daily circumstances. It was as though he had made a moat around himself which he kept filled with a cool mixture of aloofness and a tinge of sarcasm. Secure within his isolating emotional buffer, he went about his day's work protected if not by a moat then by some encircling life preserver of detachment. When necessary, he could fend off an attack on his privacy with a perfectly aimed acid-soaked dart.

In spite of all, Halsted somehow preserved just a trace of his buoyant prenarcotic personality, which he demonstrated in rare moments and only with certain close friends. He was capable of bursts of extroverted good fellowship and sudden displays of a hilarious sense of humor when he was in the company of Welch or one of his other few intimates. The truth was that even his sarcasm was meant only to

defend against those slings and arrows that are imagined by such shy men.

The moat, a certain furtiveness that overcame him in times of narcotic-need, his towering international eminence—all of these enlarged the space by which he stood separated from most other people. Those who were able to get closer felt a gentle warmth they could not have predicted, but they were few indeed. Heuer and several others have left touching descriptions of the acts of enormous kindness he demonstrated toward them, and of a brotherly affection that came from within a lonely man who in truth must have begged himself in vain for less rigidity and more love.

I know of no example that epitomizes more clearly the difference between pre- and post-Halstedian surgery than a description of Harvey Cushing's first day at Johns Hopkins as an assistant resident. After matriculating at Yale, Cushing had gone on to the Harvard Medical School, graduating in 1895. Following a year as house pupil at the Massachusetts General Hospital, he was accepted by Halsted for surgical training. Although he came to Baltimore from one of the leading medical centers of America, the transition to Hopkins was a passage out of the bruising bombast of nineteenth-century surgery and into the physiological serenity of the twentieth. The following is a description of Cushing's initiation into the new world of Hopkins surgery, as he told it to Elliot Cutler, his successor as Chief of Surgery at the Peter Bent Brigham Hospital, many years later:

> Being a newcomer he was not allowed in the operating room his first day there, though a patient from his ward was to be operated upon. It was with great misgiving that the young Cushing watched two and even three hours go by, while the great master [Halsted] took such exquisite care with each cell that there would be no injury to the patient. Finally when the patient returned to the ward after some four and one-half hours in the operating room, young Cushing was ready with restoratives and the customary medication that he had been ordered to give to surgical patients when a pupil at the Massachusetts General Hospital. When he was about to administer these medicaments, for he recalled from his days as a pupil at the Massachusetts General Hospital how ill those who returned from the operating room were even after a hurried procedure of minutes, not hours, Dr. Halsted entered the ward.
>
> Dr. Cushing spoke up and said, "I am carrying out the usual procedure."
>
> Noting the Trendelenburg position [used in the treatment of shock], Dr. Halsted said, "Is my patient ill? This is unusual. Let us examine her." Examination revealed a normal pulse rate and normal respiration. He then noted the hypodermic and said, "What is in this syringe?"
>
> "Strychnine," said Cushing. "It will do the patient good."

The gentle, meticulous "Surgery of Safety" Halsted introduced became the distinctly American approach to operative craftsmanship.

Dr. Halsted asked a third question. "What do you think strychnine will do for the patient?" Having been educated in a school where memory and orders were the rule, Cushing did not know. He was then informed by Dr. Halsted that he should read up on strychnine. "If your reading convinces you that strychnine is good for the patient, by all means use it," said Halsted. Young Cushing never gave the strychnine, and he learned a great lesson—never do anything to a patient without understanding the why and wherefore.

It was the tracking down of the why and wherefore that linked William Stewart Halsted to the distinguished line of his predecessors in scientific medicine. Beginning with the Hippocratic physicians, the advances of medical science have resulted from a mixture of curiosity and the pragmatic need to know, in order that the sick may be healed. The lesson learned by Cushing in his first day in Baltimore was a lesson that William Halsted, by his example of a lifetime of seeking, taught to every American surgeon who followed him.

Even William Halsted's death was dusted with traces of narcotic. In 1919 he required surgery for stones in his bile duct. The condition recurred the following year, and he arrived in Baltimore from High Hampton, bringing with him his own supply of morphium.

No one seems to have given a second thought, at that time or since, to the concentration of the narcotic in Halsted's solution. On arrival in Baltimore, he told his medical attendants that it was made up in the proportion of one grain of morphine to 160 drops of water, which they accepted, having no clear reason to question it, and they even remarked on the small quantities required by their stoic professor to control his pain. Knowing of the contents of "The Inner History of the Johns Hopkins Hospital," it seems not farfetched to suggest that the morphine concentration in Halsted's little bottle was quite a bit higher than his physicians were led to believe.

Two of his former house surgeons for whom Halsted had the highest regard, George Heuer and Mont Reid, were summoned from Cincinnati. On the morning of August 25, they explored their professor's bile duct and removed the single stone that was obstructing it. They closed the duct using a technique that had been invented by their patient. The postoperative course was stormy—on the afternoon of September 3, a gastrointestinal hemorrhage occurred. In spite of blood transfusions, the situation worsened, and on the morning of Thursday, September 7, 1922, Heuer and Reid lost their revered mentor to a postoperative pneumonia.

William Halsted's resting place is in Greenwood Cemetery in Brooklyn, across New York Bay overlooking lower Manhattan, where his early surgical triumphs had taken place, and his travail. Not far from his grave lie such leading figures in America's history as Horace Greeley, Henry Ward Beecher, Peter Cooper, and Samuel F.B. Morse. They are worthy company for the greatest surgical scholar our country has ever produced. □

Sherwin B. Nuland, MD, who teaches surgery and the history of medicine at Yale, is also literary (scientific) editor of Connecticut Medicine *and associate editor of the* Journal of the History of Medicine and Allied Sciences. *His book* The Origins of Anesthesia *is a volume in the Classics of Medicine Library.*

Drug War Fatality

The Medical Potential of Illicit Drugs

by Lester Grinspoon

In the era of Prohibition, it was said of the alcohol problem that, between the distillers and saloon keepers on one side and the prohibitionists on the other, no intelligent person thought there was any solution at all. The same may be true of the illicit drug problem today, with its traffickers and users on one side and its moralists and police on the other. The drug problem is perhaps more serious because the acceptable range of solutions is so narrow: there is very little effective opposition to prohibition.

The American "war on drugs" began with the Harrison Narcotics Act in 1914 and has escalated in the last 20 years. Federal, state and local governments now spend an estimated eight to nine billion dollars a year on direct drug enforcement activities, and millions more to house and feed the drug dealers and users who now comprise one-third of the federal prison population and contribute substantially to the need to build more prisons.

It is sometimes said that the pendulum of public opinion swings back and forth between harshness and leniency in drug control. If there was some swing toward leniency in the early 1970s, it now appears to be going the other way, as indicated by the September 1989 White House paper on national drug control strategy. This paper, referred to as the Bush-Bennett plan, calls for even more spending on law enforcement.

Drugs continue to enter the United States at a growing rate despite the war effort. That effort does, however, inflate prices and keep the drug dealers' franchises lucrative. Another consequence of the war is a black market in drugs, which results in drug-related crime and violence, just as the black market in alcohol did in the 1920s. The threat to civil liberties grows as the drug warriors, already by necessity using entrapment and informers, now make plans to send in the army and periodically examine everybody's urine. They are already randomly testing the urine of federal employees.

Much of the drug-war publicity is aimed at cocaine, but obscured is the fact that the number of people using cocaine is declining. The reason is that the middle class is giving up the drug, just as it continues to give up the even more addictive nicotine. When people who are not otherwise desperate become aware of the dangers of drugs, they begin to avoid them. Cocaine abuse is now largely a problem of the inner cities. Increasingly, cocaine users are people who feel hopeless, trapped and alienated, who are able to find only miserable jobs at low pay or no jobs at all.

The answer to these problems is not likely to be found in criminal law enforcement, which the Bush Administration practically equates with prevention. No policy aimed directly at drugs and drug users can deal with the social issues that are the true heart of what is loosely, inadequately, and propagandistically labelled the "drug problem."

The main obstacle to thinking about any serious alternative to present policies is that no one in government wants to give up the symbolism of criminal law or the commitment that has been made over the last 70 years, not only in the United States but all over the world, to treating drugs as a criminal problem.

But there is a great deal of public ambivalence, or, to put it less kindly, hypocrisy, where this issue is concerned. The moral consensus about the evil of drugs is often passionate but sometimes shallow. We pretend that eliminating drug traffic is like eliminating slavery or piracy, or sometimes as though it is like eradicating smallpox or malaria. It is accepted in public discourse that everything possible has to be done to prevent everyone from ever using any controlled substances. On the other hand, there is an informal lore of drug use that is more tolerant. A type of pretense that we have long abandoned in the case of alcohol is still considered the only respectable position where other drugs are concerned.

Any serious approach to this problem demands a recognition of the prob-

lem's complexity and ambiguity. We have to compromise between social reality and the dream of a drug-free society. We may have to acknowledge that the use of drugs and alcohol has benefits as well as dangers.

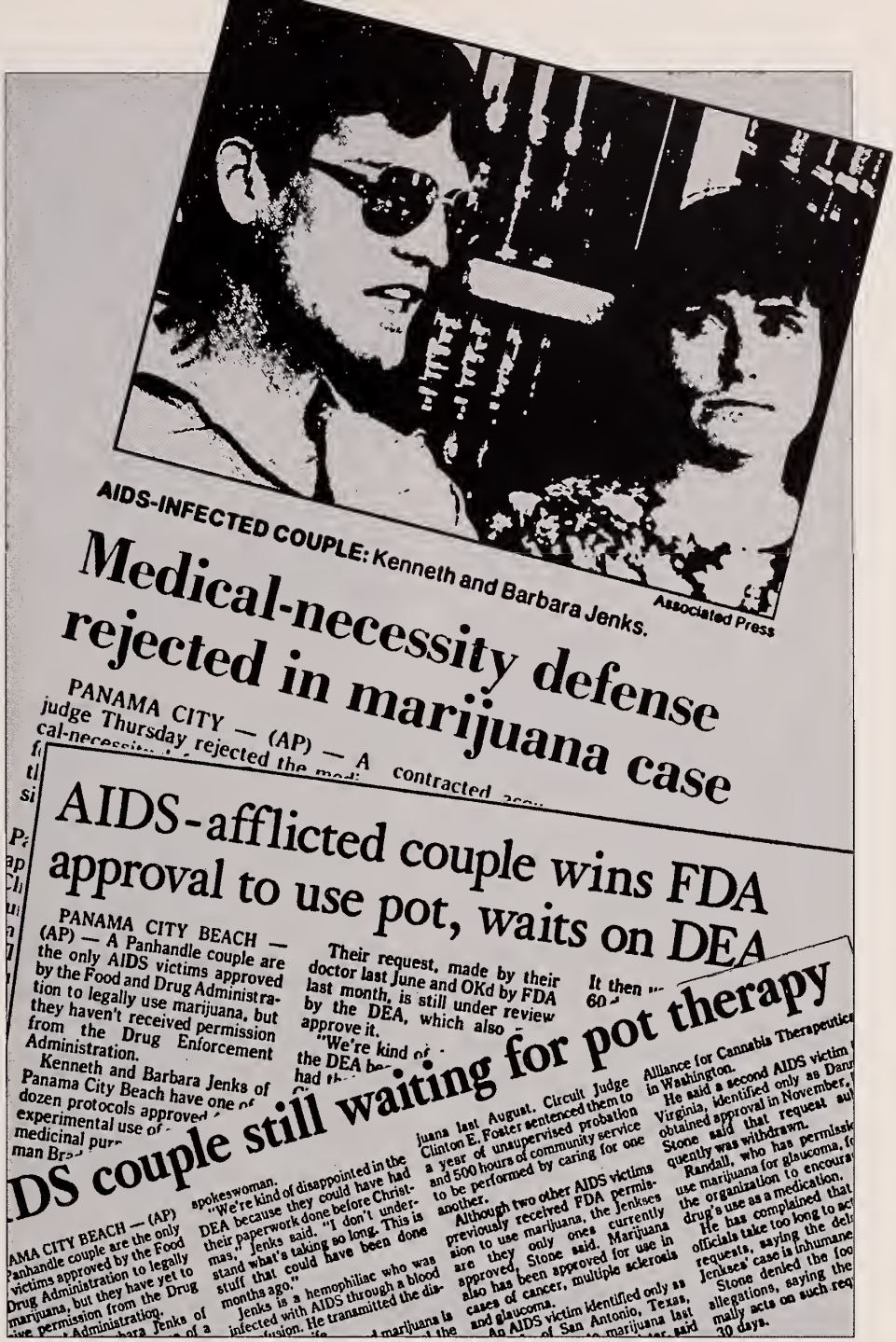
When I began to study marihuana in 1967, I had no doubt that it was a very harmful drug, which was unfortunately used by more and more foolish young people who would not listen to or could not understand the warnings about its dangers. My purpose was to define scientifically the nature and degree of those dangers. In the next three years, as I reviewed the scientific, medical and lay literature, my views gradually changed. I came to understand that I, like so many other people in this country, had been brainwashed. My beliefs about the dangers of marihuana had very little empirical foundation. By the time I completed the research that formed the basis for *Marihuana Reconsidered,* I had become convinced that cannabis was considerably less harmful than tobacco and alcohol, the most commonly used legal drugs.

What followed has been continued fascination with various psychoactive drugs, which are used by large numbers of people outside of medical prescribing or supervision. I started looking into the amphetamines, which physicians were "pushing" in the '40s through the '60s, and wrote *The Speed Culture: Amphetamine Use and Abuse in America*. This led to *Cocaine: A Drug and Its Social Evolution,* which I wrote with James B. Bakalar. This was followed by *Psychedelic Drugs Reconsidered, Psychedelic Reflections* and *Drug Control in a Free Society.* In the course of 24 years of researching these substances, I have learned that there is something very special about illicit drugs. If they don't always make the drug user behave irrationally, they certainly cause many nonusers to behave that way. And one of the manifestations of this irrationality is the way in which the exploration of beneficial uses of some of these drugs has been obstructed by the government because of their black and white approach: all use of these drugs is necessarily bad.

Of all the bad consequences of government harassment of marihuana users, none is more tragic than the medical ban on cannabis. Cocaine and morphine are legally available as medicines; marihuana is not. It has been well known for thousands of years that cannabis has more than one medical use. It is far safer than most medicines prescribed by doctors daily, and often works for patients who cannot tolerate the side effects of other drugs. In many cases no other drug will do the job as safely or as well.

Like other psychoactive drugs derived from natural plant sources, marihuana has long been used as a medicine as well as an intoxicant. It was listed in an herbal compendium published by a Chinese emperor that may go back to 2800 B.C. In Jamaica, where it was introduced in the 17th century by African slaves, it has become the most important popular folk medicine. Cannabis in the form of an alcoholic tincture was commonly used in 19th century Europe and the United States as an anticonvulsant, sedative and analgesic. It was thought to be a useful appetite stimulant and a milder but less dangerous sedative than opium. It was used to treat tetanus, neuralgia, uterine hemorrhage, rheumatism and other conditions.

Between 1839 and 1900 more than a hundred articles on the therapeutic uses of marihuana appeared in scientific journals. After the introduction of injectable opiates in the 1850s, and synthetic analgesics and hypnotics in



AIDS-INFECTED COUPLE: Kenneth and Barbara Jenks. Associated Press

Medical-necessity defense rejected in marijuana case

PANAMA CITY — (AP) — A judge Thursday rejected the med... cal-necessit... contracted ...

AIDS-afflicted couple wins FDA approval to use pot, waits on DEA

PANAMA CITY BEACH — (AP) — A Panhandle couple are the only AIDS victims approved by the Food and Drug Administration to legally use marijuana, but they haven't received permission from the Drug Enforcement Administration.

Kenneth and Barbara Jenks of Panama City Beach have one of ... dozen protocols approved ... experimental use of ... medicinal purp... man Bra...

Their request, made by their doctor last June and OKd by FDA last month, is still under review by the DEA, which also ... approve it.

"We're kind of ... the DEA be... had th...

It then ... 60 ...

DS couple still waiting for pot therapy

AMA CITY BEACH — (AP) — Panhandle couple are the only victims approved by the Food Drug Administration to legally marijuana, but they have yet to ive permission from the Drug Administration.

... Jenks of a ... spokeswoman.

"We're kind of disappointed in the DEA because they could have had their paperwork done before Christmas," Jenks said. "I don't understand what's taking so long. This is stuff that could have been done months ago."

Jenks is a hemophiliac who was infected with AIDS through a blood ... sion. He transmitted the dis... ... marijuana is ... the

juana last August. Circuit Judge Clinton E. Foster sentenced them to a year of unsupervised probation and 500 hours of community service to be performed by caring for one another.

Although two other AIDS victims previously received FDA permission to use marijuana, the Jenkses are the only ones currently approved, Stone said. Marijuana also has been approved for use in cases of cancer, multiple sclerosis and glaucoma.

An AIDS victim identified only as ... of San Antonio, Texas, ... marijuana last ... said

Alliance for Cannabis Therapeutics in Washington.

He said a second AIDS victim ... Virginia, identified only as Dan... obtained approval in November, ... Stone said that request ... quently was withdrawn.

Randall, who has permissi... use marijuana for glaucoma, f... the organization to encour... drug's use as a medication.

He has complained that ... officials take too long to ac... requests, saying the del... Jenkses' case is inhumane.

Stone denied the foo... allegations, saying the ... mally acts on such req... 30 days.

MIAMI HERALD, 8/19/90, 9/29/90, 1/5/91

the early 20th century, the medical use of cannabis declined. But even as late as 1937 extract of cannabis was still a legitimate medicine marketed by drug companies.

The Marihuana Tax Act in 1937 imposed a registration tax, and record-keeping requirements made medical use of cannabis so cumbersome that it was dropped from the U.S. Pharmacopoeia and National Formulary. The Marihuana Tax Act was introduced under the influence of a growing concern about the use of marihuana as an intoxicant, especially among blacks and Mexican-Americans in the South and Southwest. A strong campaign by the Federal Bureau of Narcotics pushed the law through Congress, although there was little evidence that marihuana was harmful.

The greatest advantage of cannabis as a medicine is its unusual safety. The ratio of lethal dose to effective dose is estimated on the basis of extrapolation from animal data to be about 40,000:1 (compared to 3-50:1 for secobarbital and 4-10:1 for alcohol). Huge doses have been given to dogs without causing death, and there is no reliable evidence of death caused by cannabis in a human being. Cannabis also has the advantage of not disturbing any physiological functions or damaging any body organ when used in therapeutic doses. It produces little physical dependence or tolerance; there is no evidence that medical use of cannabis has ever led to habitual use as an intoxicant.

A promising new medical use for cannabis is the treatment of glaucoma, the second leading cause of blindness in the United States. About a million Americans suffer from the form of glaucoma (open angle) treatable with cannabis. Marihuana causes intraocular pressure to fall and retards the progressive loss of sight when conventional medication fails and surgery is too dangerous. THC eyedrops have not proved effective as a substitute, and as long ago as 1981 the National Eye Institute announced that it would no longer approve human research on these eyedrops. Studies continue on eyedrops containing other natural cannabinoids and synthetic cannabis derivatives.

Cannabis also has a use in the treatment of cancer. About half of patients undergoing chemotherapy for cancer suffer from severe nausea and vomiting, which are not only unpleasant but a threat to the effectiveness of the therapy. Retching may cause tears of the esophagus and rib fractures; vomiting prevents adequate nutrition and leads to fluid loss. For about a third of patients, the standard antiemetics do not work. The suggestion that cannabis might be useful arose in the early 1970s when some young people receiving cancer chemotherapy found that marihuana smoking, which was of course illegal, reduced their nausea and vomiting.

Marihuana is becoming increasingly recognized as the drug of choice for pain that accompanies muscle spasm. This kind of pain is often chronic and debilitating, especially in paraplegics, quadriplegics, other victims of traumatic nerve injury, and people who suffer from multiple sclerosis or cerebral palsy. Many MS victims and others have discovered that cannabis not only allows them to avoid the risks of opioids for pain relief, but also reduces their muscle spasms and tremors, often making it possible for them to leave their wheelchairs and walk.

There are many other possibilities for using marihuana to reduce human suffering at a small cost in toxic side effects. Anecdotal accounts strongly suggest that cannabis may be useful in treating other types of pain, as well as seizure disorders, appetite loss, asthma, hyperemesis gravidarum and atopic neurodermatitis.

If any other medicine had shown similar promise, public and professional interest would be intense. But the government, in its zeal to prosecute the War on Drugs, has been doing everything it can to reduce that interest and prevent the fulfillment of marihuana's medical promise.

Advertisements of 19th century medicines that contained narcotic ingredients, such as morphine (above) and cocaine.

Meanwhile the medical ban produces absurd and appalling consequences; the most recent is the government assault on Kenneth and Barbara Jenks, a Florida couple in their 20s who contracted AIDS through a blood transfusion given to the husband, a hemophiliac. Both were suffering from nausea, vomiting and appetite loss caused by AIDS or AZT; doctors feared that Barbara Jenks would die of starvation before the disease killed her. In early 1989 the Jenks learned about marihuana through a support group for people with AIDS. They began to smoke it, and for a year they led a fairly normal life. They felt better, regained lost weight, and were able to stay out of the hospital; Kenneth Jenks even kept his full-time job.

Then someone informed on them. On March 29, 1990 ten vice squad cops battered down the door of their trailer, held a gun to Barbara Jenks's head, and seized the evidence of crime—two small marihuana plants they had been growing because they could not afford to pay the street price of the drug. Cultivation of marihuana is a felony in Florida; the Jenkses faced up to five years in prison. At their trial in July, the Jenkses used the defense of medical necessity, which has succeeded only three times in the history of the United States. The judge rejected this defense and convicted the Jenkses, although he imposed essentially no punishment.

The arrest of the Jenkses is just one unusually conspicuous result of a policy that is ordinarily disastrous in a quieter way. Sick people are forced to suffer anxiety about prosecution in addition to their anxiety about the illness, with therapeutically damaging effects. Doctors are afraid to recommend what they know to be the best treatment because they might lose their reputation or even their license. Research is suppressed and medical wisdom ignored so that the government can enforce its views on the danger of recreational marihuana use.

Research into the potential psychotherapeutic use of certain drugs has also been curtailed by the government's knee-jerk response of labeling all illegal drugs as extremely dangerous and without medical use.

We have used psychiatric drugs as an adjunct to psychotherapy, and psychotherapy as an adjunct to psychiatric drugs. But efforts to make use of drugs directly to enhance the process of psychotherapy—diagnosing the problem, enhancing the therapeutic alliance, facilitating the production of memories, fantasies, and insights—have been very limited. In preindustrial cultures, however, there is an ancient tradition in which drugs are used to enhance a process of psychotherapeutic healing; and from 1950 to the mid-1960s, there were 15 years of experimentation in Europe and the United States—an episode in the history of psychiatry that is now almost forgotten. The drugs used in these therapeutic efforts were psychedelic or hallucinogenic substances, both natural and synthetic.

There is now a possibility that this tradition might be revived by the use of new synthetic phenethylamines, such as MDMA, that may have many of the virtues of the older psychedelics as enhancers of the psychotherapeutic process, without most of their disadvantages. I am not advocating the use of MDMA or other psychedelics, but I see their investigation as a path we ought to be exploring to determine whether there is a psychopharmacological way to enhance the capacity for insight. The question we should be able to explore is: Does MDMA have a place along this pathway?

Ever since experimentation with psychedelic plants began, some users have maintained that the experience could be useful for self-exploration, religious insight, or relief of neurotic and somatic symptoms. The plants have been used for thousands of years in a number of cultures for healing and in magical and religious rites. These rites are often conducted by a shaman or professional healer. The religious and therapeutic use of psychedelic plants continues in the Amazon basin, in southwestern Mexico, where psychedelic mushrooms are used in healing rites, and in the Native American church services of Indians in the western United States, which make use of the peyote cactus. The peyote ritual has been proposed as a possible adjunct to the treatment of alcoholism among American Indians.

Psychedelics were also used extensively in psychotherapy as experimental drugs in Europe and the United States for almost two decades. A large number of clinical papers and several dozen books on psychedelic therapy were published. They were employed for a wide variety of problems including alcoholism, obsessional neurosis and sociopathy. They were also used to ease the process of dying. Complications and dangers were generally reported to be minimal. It soon became clear that with proper screening, preparation and supervision, it was possible to minimize the danger of adverse reactions.

Beginning in the early 1960s, as illicit use of LSD and other psychedelic drugs increased, it became difficult to obtain the drugs for psychiatric research or to get funding for such research, and professional interest de-

Federal Bureau of Narcotics anti-drug poster from the 1930s.

clined. Those two decades of psychedelic research may some day have to be written off as a mistake that has only historical interest, but it might be wiser to see if something could be salvaged from them.

MDMA (3,4-methylenedioxymethamphetamine) is a relatively mild, short-acting drug that is said to give a heightened capacity for introspection and intimacy along with temporary freedom from anxiety and depression, and without distracting changes in perception, body image or the sense of self. It was first synthesized in 1914 and began to come into both therapeutic and nontherapeutic use in the United States and Europe in the early 1970s. What we know about it now is largely anecdotal, but enough has been written to accurately describe the general nature of the experience. As compared with the more familiar psychedelic drugs, it evokes a gentler, subtler, highly controllable experience, which invites rather than compels intensification of feelings and self-exploration. The user is not forced onto any mental or emotional path that is frightening or even uncomfortable.

A few psychiatrists and other therapists in the United States have used MDMA as an aid to psychotherapy for more than 15 years. It has now been taken in a therapeutic setting by thousands of people, apparently with few complications. In 1984 the Drug Enforcement Administration foreclosed clinical research on MDMA by placing it in Schedule I. While some clinical research is being pursued in Europe, there are no extant clinical studies in the United States.

Psychiatrists who have used MDMA suggest that it might also be helpful in marital counseling and in diagnostic interviews. The reports of therapeutic results so far are anecdotal, unpublished and unverified and require more systematic study, but they are promising. MDMA carries little of the baggage that made it difficult to work with LSD in psychotherapy—the 8- to 12-hour duration of action, the possible loss of emotional control, the perceptual distortion, and the occasional adverse reactions and flashbacks.

MDMA is generally used once or at most a few times in the course of therapy. It is said to fortify the therapeutic alliance by inviting self-disclosure and enhancing trust. Some patients also report better mood, greater relaxation, heightened self-esteem, and other beneficial changes that last for several days to several weeks. Patients report that they lose

The head of the class.

A contemporary federal anti-drug poster.

defensive anxiety and feel more emotionally open, which makes it possible for them to get in touch with feelings and thoughts not ordinarily available to them.

One MDMA patient wrote: "One of the major 'differences' [from a non-MDMA-assisted psychotherapy session] was the feeling of security and tranquility. I had the feeling of being safe. Nothing could threaten me. I briefly tried to fantasize natural catastrophes, like an earthquake. I did not feel anxious or threatened." This patient also suggests that the effects of MDMA-assisted therapy may endure. Eighteen months after her third and last MDMA session, when she was asked whether she thought there was a lasting benefit, she replied, "I have been able to experience myself more fully . . . to feel my feelings . . . to be totally with myself . . . to experience the ease of expressing myself. . . . The sessions enabled me to break through my defenses (rationalizing, analyzing, intellectualizing, etc.) that I used to win approval of myself and others . . . to break through my facade and to go to the truth underneath. . . . At various times [that truth] meant grief, love, sadness, fear, humor."

Our society still has not found a way to be at ease with psychedelic drugs, but the scientific and medical communities should eventually acknowledge their potential, devise new and better questions to ask, and give psychedelic research another chance. To ignore the possibilities of drug-enhanced psychotherapeutic healing could mean limiting the potential of psychotherapy itself to help people gain insight into their problems and bring more perspective to their lives.

As a civil libertarian and a physician, I am concerned about the Prohibition-like solution to all disapproved-of drugs. As a society we have to make up our minds; we can't have it both ways. We cannot be both drug-free and free. And one freedom we are giving up, which we as physicians should be particularly concerned about, is the freedom to explore the therapeutic potential of some of these currently prohibited drugs. □

Lester Grinspoon '55 is an associate professor of psychiatry at HMS and the Massachusetts Mental Health Center, and is editor of The HMS Mental Health Letter.

Harvard University
Cambridge, Massachusetts 02138
July 1, 1994

Dear Harvard Faculty Member:

As you well know, the epidemic of illegal drug use in the United States has reached crisis proportions. Each day countless thousands of our most promising and talented youth fall deeper into the cycle of drug abuse and addiction. Drug use in the workplace is costing billions yearly in lost economic productivity, and drug-impaired workers are endangering their fellow employees and the public safety as a whole. Our criminal justice system is taxed to the limit because of drug-related crimes.

Harvard's esteemed position at the pinnacle of higher education must necessarily extend to a decisive, responsible stand on critical social issues. Colleges and Universities throughout the United States will look to the example we set as they seek ways to cope with the scourge of drugs on campus. The Trustees have unanimously decided that Harvard University must take clear, positive action to contribute to the war on drugs. We must send an unequivocal message to our students, to each other as faculty members, and to those on the outside who value our example, that illegal drug use at Harvard University will not be tolerated. Further, the mandate of higher education is so critical to the future of our Nation that any possibility of interference by drugs is unacceptable. As Harvard Faculty Members, our burden of intellectual responsibility for the growth and development of our students is a very serious one, and we cannot risk the possibility that our judgment or conduct could be clouded in any way by even casual drug use.

THE NEW BIG BROTHER

MANDATORY DRUG TESTING

by David J. Greenblatt

Our goal is a drug-free University. As an important step toward that objective, the Trustees have decided that a program of University-wide mandatory, random urine drug-testing of all faculty members will begin on October 1 of this year. The program will be administered by the Harvard University Security Service, in conjunction with Deans of the individual schools.

Each faculty member will be tested an average of four times yearly, at random intervals based on a computer-generated sequence. The tests will be unannounced. Faculty members, when requested by a Security Officer, will provide a freshly voided urine sample. To prevent sample tampering or adulteration that would jeopardize the fairness and integrity of the program, the Security Officer will directly witness the collection of the sample. After being sealed and appropriately labeled, the sample will be transmitted to the designated laboratory, using strict chain-of-custody procedures.

The sample will be tested for the presence of intoxicating drugs (marihuana, cocaine, opiates and amphetamines). Test results will be strictly confidential, and will be reported only to a designated medical officer at each school.

The University recognizes that treatment and rehabilitation, as opposed to simply detection and enforcement, are cornerstones of lasting solutions to drug use. Accordingly, individuals who test positive the first time will be permitted to continue their regular scholarly activities, but will be required to participate in a counseling program for substance abuse. In general, the counseling will be on an outpatient basis, but in some cases the medical officer may recommend inpatient treatment. In either case, the cost of the program will be borne by the University. It must be recognized that follow-up testing is part of the treatment and rehabilitation process. Because of the seriousness of relapse or continued illicit drug use, those who test positive a second time will be suspended from their faculty responsibilities. Further treatment may be indicated, but the University reserves the right to dismiss those individuals who test positive more than once.

Certain prescription medications are known to produce positive results in the testing procedures. To avoid any problems, for this reason, faculty members will disclose all prescription medications that they are taking, as well as the reasons for use of each medication, to the Security Officer at the time of sample collection. This information will be forwarded to the medical officer who has the option of verifying the list with the physician who prescribed the medication. Faculty members should also be aware of other situations causing interference with urine tests. Ibuprofen, available over the counter as Advil, Nuprin and others, will mask the detection of marihuana in urine. Accordingly, use of ibuprofen by Harvard Faculty Members is not permitted.

You are strongly advised to avoid ingesting foods containing poppy seeds, or use of over-the-counter cough medications containing dextromethorphan. Both of these can cause positive tests for heroine (opiates). As you well know, inhalation of smoke from others who are smoking marihuana can show up as a positive test for marihuana in your own urine. You would be wise to avoid social situations in which this is a possibility. Finally, dermal absorption of cocaine, causing a positive urine test, has recently been documented as a consequence of handling materials that have come in contact with cocaine powder. This should be considered by all faculty members, particularly those involved in biomedical research on cocaine. As we become aware of other situations that may interfere with urine drug tests, we will pass the information on to you.

We realize that our University-wide faculty drug-testing program is not without some degree of burden. Some faculty members will need to reevaluate and change their own personal and social habits. But the threat of drugs in American society and on our campuses is grave, and the path to a lasting solution will require all of us to bear some inconvenience. The Trustees are committed to achieving a drug-free University, and your full cooperation with the drug-testing program is anticipated.

Sincerely,
The Board of Trustees

Hypothetical? Don't be too sure. Programs of random, mandatory, unannounced urine drug-testing—with no clinical indication for individual tests—are being unilaterally forced on American workers by managers in both the private and public sectors of the workplace. Random drug-testing is done by federal and municipal departments, including police, fire, utilities and transportation departments and the armed forces, and by hundreds of private corporations.

In numerous cases the affected workers, either individually or collectively, have sought legal protection from random drug-testing via the nation's courts. In some instances these courts have decided in favor of the employees and prohibited random testing; in other cases the courts have permitted random testing, and many cases are still pending a decision.

Physicians who say "it won't happen to us" don't understand how dangerously far we have already fallen down the slippery slope. Only vociferous objections by staff physicians narrowly prevented a random drug-testing

program from being imposed on physicians at Johns Hopkins Hospital. Veterans Administration officials are seeking to implement random drug-testing for all V.A. employees, including physicians; the matter is now pending in the courts. It can, indeed, happen to us.

The many opponents of drug-testing correctly point out that such programs fail to assure—or even to evaluate—whether the workplace is "safe." Moreover, the mandatory, unindicated collection of body fluid violates constitutional protection against random search without cause. (Those who think the collection of a urine sample is not invasive should listen to women who have been forced to produce a urine sample while being witnessed and report the incident as being one of the most humiliating things they have ever experienced.) Scholars have termed drug-testing as "Chemical McCarthyism" that turns us into a "nation of suspects."

Drug-testing proponents, on the other hand, justify the curtailment of constitutional rights based on the clear and immediate danger to public safety posed by drugs and drug-impaired workers. The content of their argument is eerily similar to, and often directly paraphrases, the justification for curtailment of liberties used by the German government in the 1930s.

It is easy to do nothing and let drug-testing happen. "I don't use illegal drugs," you may say, "I have nothing to worry about." But you do have plenty to worry about, because no analytic method is perfect. Even the most careful and rigorous analytical laboratory has an irreducibly non-zero false positive rate. A typical value is 0.5 to 1.0 percent. If 1,000 people are tested, 5 to 10 drug-free individuals will test positive for no apparent reason.

The consequences are grave. These "victims" of testing may be labeled as drug-users or addicts and remanded to a treatment or counseling program. They may be denied employment or promotion, subjected to disciplinary action, or dismissed altogether. Above and beyond the unexplained false positives are the positive results produced by (to name a few possibilities) ingestion of poppy seeds or cough medicines, by passive inhalation of marihuana smoke, or by dermal absorption of illegal chemicals. On several occasions, I have served as a consultant on behalf of undercover law enforcement officers who, after handling chemicals seized in a "drug bust," have tested positive for cocaine and been suspended or dismissed. To put it bluntly, you could be nailed as a drug-user because of your diet, your lifestyle or your occupation.

Ironically, drug-testing has nothing to do with a "safe" workplace, because a urine drug test—whether positive or negative—is unrelated to fitness for work. Urine concentrations of drug metabolites reflect excretion rates of metabolites as well as urine volume, rather than actual concentrations of intact drugs in the blood or brain. Urine tests transmit no information about how much drug was ingested or inhaled, the frequency of exposure, the timing of exposure, or the clinical effects of drug use. A positive test for marihuana may occur days or weeks after a *single* exposure to marihuana. Consequently, a positive urine test for a drug does not imply abuse or addiction, nor does it indicate intoxication or impairment by that drug, either at the time the sample was collected or any other time before or after that.

Scholars have termed drug-testing as "Chemical McCarthyism" that turns us into a nation of suspects.

The converse is also true; a negative test does not rule out abuse, addiction or intoxication. Equally ironic is the fact that most drug-testing programs focus on illegal drugs but ignore ethanol, which is, in order of magnitude, more important in terms of workplace impairment and lost productivity.

The slide down the slippery slope will continue if we let it happen. The medical profession should loudly oppose and collectively refuse to participate in urine drug-testing programs. At the same time, we can offer constructive alternatives that have the potential to enhance workplace safety. If fitness for work is the issue, technology is available that can systematically test attention, reaction time and psychomotor performance. This approach is not without problems, but at least it can potentially detect impairment for any reason—intercurrent illness, lack of sleep, personal stress or foreign chemicals.

The medical profession probably could also support "for cause" chemical testing analogous to the model used to test the role of ethanol in impaired driving. For example, objective performance testing or an evaluation by a work supervisor might suggest that a given employee's work fitness is impaired relative to his or her own usual "norm." If there is reason to suspect that drugs—legal or illegal—might be contributing to impairment, a medically trained individual could reasonably request a blood sample to confirm or rule out the possible causal role of intoxicating chemicals.

The sample should be blood, however, *not* urine, since drug concentrations in the blood in general are proportional to concentrations in the brain. "For cause" testing of blood presupposes the availability of adequate research data, which is not yet available, to establish blood concentration ranges for marihuana and cocaine that are consistent with probable intoxication, such as has been done for ethanol. Considerable additional research would be necessary to establish these ranges for marihuana and cocaine.

Partly because of our "too little, too late" response to ominous legislative and regulatory signs, physicians have had to swallow an onerous burden of external regulatory control. In the last decade virtually no aspect of our professional life—clinical decision-making, prescribing of medications, clinical and basic research—has been untouched by encroaching regulation. Random urine drug-testing threatens to extend the surveillance and control to our personal and private lives. Unless we speak loudly, collectively and *now,* it is only a matter of time before the letter from the trustees, the dean or the hospital administrator appears in our mailbox. □

David J. Greenblatt '70 is chief, Division of Clinical Pharmacology, New England Medical Center Hospital, and professor of pharmacology, psychiatry and medicine at Tufts University School of Medicine.

Dwindling Forest

Medicinal Plants of the Amazon

by Richard Evans Schultes

In the few parts of the world still not affected by fast encroaching civilization, there exists a wealth of information on the properties of plants that is still available to us. It will not long be there for us to salvage. It has been built up by peoples in primitive societies over millennia by trial and error, for they have had to rely on their ambient vegetation for their foods, medicines and all the other necessities of life.

When our civilization arrives with roads, missionary activities, commercial interests, tourism or otherwise, the products of our culture are rapidly adopted and, often even in one generation, replace what has for hundreds of years been a part of their culture. This erosion of native ethnobotanical knowledge and use is nowhere more rapid than in the realm of biodynamic plants—medicinal, narcotic and toxic species.

There have long been two strongly divergent poles in our evaluation of the worth of ethnobotanical studies. Many investigators have been carried away with enthusiasm that native peoples have had some special intuition that permitted them to seek out "nature's secrets." Others have cast aside or denigrated all native folklore as not worthy of serious scientific attention. Naturally, both points of view are extreme and are unwarranted.

The accomplishments of native peoples in understanding plant properties so thoroughly must be simply a result of a long and intimate association with their floras and their utter dependence on them. Consequently—and especially since so much aboriginal knowledge is based on experimentation—it warrants careful and critical attention on the part of modern scientific efforts. It behooves us to take advantage now of this extensive knowledge that still exists in many parts of the world, lest it be lost with the inexorable onrush of civilization and the resulting extinction of one primitive culture after another.

The denigration of aboriginal knowledge of the biodynamism of plants has even led certain specialists recently to assert that there is little or no correlation between native uses of medicinal plants and the chemistry of these species. This viewpoint is not borne out by the history of some of the most recently discovered drugs that have come originally from the plant kingdom—the so-called "wonder drugs" of the past half century.

Almost all of these numerous wonder drugs have first been isolated from plants employed for one purpose or another in primitive or ancient societies: the curare alkaloids; penicillin and other antibiotics; cortisone; reserpine; vincoleucoblastine; the veratrum-alkaloids; podophyllotoxin; stropanthine; and other new therapeutic agents.

A statistical study of empirical medicine amongst the Aztecs indicates that their medicinal plants appear to be effective when judged by native standards. Of the 25 plants evaluated, 16 are known chemically to be able to produce the results claimed by the Aztecs; four could possibly be so active; whereas five—only 20 percent—seem not to be able to produce the effects attributed to them by the Indians. While magic and religion played an important role in Aztec medical practices, there did exist a real empirical basis, which has often been ridiculed or ignored.

We can no longer afford to ignore reports of any aboriginal use of a plant merely because they seem to fall beyond the limits of our credence. To do so would be tantamount to the closing of a door, forever to entomb a peculiar kind of native knowledge which might lead us along paths of immeasurable progress.

Several botanical explorers of the

last century—e.g., von Martius and Spruce—stated that the Indians of the Amazon had a limited vegetal pharmacopoeia. This opinion is not easy to reconcile with my own observations over the past 50 years amongst many tribes of the Colombian Amazonia.

Fourteen years of this period were spent in permanent residence in the region. I was able to make 24,000 plant collections; of these, I have notes on the aboriginal use of some 2,000 species for their biodynamic properties. I am certain that many uses have escaped my attention, and that future students—if they hurry to get ahead of rapidly advancing acculturation and consequent loss of native plant lore—will discover many more.

The flora of the Amazon is extensive—with probably some 80,000 species. One expert has estimated that nothing is known about the chemical composition of 99.6 percent of the Amazon's flora. Certainly almost all of the biodynamic species for which I have notes have never been chemically analyzed. Some of the uses may be of little or no practical value, but for many it is possible to see or appreciate their physiological effectiveness. Few may actually be curative, but an appreciable number probably are alleviative.

Whatever the case may be, if a plant has any physical activity, it indicates the presence of at least one active chemical constituent. We should know what these constituents are: they may not be of any value in our Western pharmacopoeias; they may find wholly different uses in our technology; a few may yield drugs for modern medicine to treat the same conditions for which they are applied in primitive societies. And many species hold promise of the discovery of new chemical compounds, for it is now realized that unstudied tropical flora as rich as that of the Amazon represents a vast emporium of unknown chemical compounds awaiting discovery.

Included in my ethnopharmacological notes and those of several of my students and colleagues are at least 32 species, the uses of which suggest possible cardiovascular activity; 90 are involved as probable major ingredients of arrow poisons; 27 seem to be insecticidal or insect-repellent; 57 are employed as fish poisons; 4 are valued as presumed oral contraceptives; more than 85 are taken as vermifuges; over 100 are believed to be febrifuges; a few are styptics; two dozen are applied to clean or hasten the healing of infected sores and wounds; 5 or 6, it is claimed, relieve conjunctivitis; 6 are said to be stimulants; 11 are esteemed as hallucinogens or narcotics; and so the list could continue.

It is probable that there are few regions in the world where the indigenous populations possess a fuller acquaintance with the properties of their plants. The region is sparsely populated by numerous tribes of very diverse origins, cultures, languages and methods of using bioactive plants. Until recently the area has been by nature isolated and protected from external penetration, since rapids and waterfalls have rendered navigation impossible. Furthermore, the region is floristically the most variable and the richest in the Amazon Valley. All of these factors have tended to contribute towards the extreme ethnopharmacological wealth of the northwestern sector of the hylea.

The appreciation and utilization of plants for medicinal purposes, however, varies significantly from tribe to tribe. Some—the Colombian Sionas, Kofáns, Witotos, Boras, Yukunas, Tanimukas, Kubeos, Tukanos, Barasanas, Makunas, Kuripakos, Puinaves and certain tribes of Makús, for example,

Falls of Yayacope in Vaupes, Colombia.

PHOTOS COURTESY OF RICHARD SCHULTES

Colombian Kamsa Indian boy, holding the flower of a powerful hallucinogen used in the diagnosis of disease and for divination.

have rich pharmacopoeias. Other groups—the Waoranis of Ecuador, living in the same species-rich forests—have a dearth of plants therapeutically employed: intensive research indicates that they use only 35 species, 30 of which are valued in treating only 6 conditions; while their neighbors, the Kofáns, have at least 80 species for 27 different ailments.

It is true that the "medicines" par excellence are those with psychic properties that enable the medicine man through various hallucinations to see or converse with malevolent spirits from whom, they believe, come all sicknesses and death. These "medicines" are manipulated by "payés" or medicine men. It is, however, most certainly untrue that the general native population of this region does not know and use those medicinal plants with purely physical properties to reduce pain or suffering, to lessen uncomfortable symptoms or illnesses, or even apparently, on rare occasions, to cure pathological conditions.

My experience has convinced me that, insofar as plants are concerned, the payé, as knowledgeable as he is, often may know less about the flora in general and its properties than does the general practitioner; the payé usually employs "sacred" plants—hallucinogens or other psychoactive species—administering them in magico-religious ceremonies with superstitious helps such as sucking, blowing tobacco smoke, fanning with feathers, incantations, et cetera.

Most tribes have what we might term "regular" doctors—chiefs or "curacas" who do not normally practice much magic, but who are well provided with a wide knowledge of the curative or presumed therapeutic value of plants with actual physically active principles. These practitioners might justly be called the ethnopharmacologists of the societies. They usually work cooperatively with the payés, frequently referring difficult or recalcitrant cases to these "specialists."

Then there is also a large body of knowledge of plant properties that is held and shared by the general population of these tribes, and it is this body of knowledge, based on hundreds of years of experience, that may be of the greatest ethnopharmacological interest to us.

People on every continent have learned to tip their arrows or darts with poisonous preparations, derived mainly from plants. In a number of species so employed, South America is the center for the use of arrow poisons or curares. And in diversity of ingredients, it appears that the northwestern part of the Amazon represents the epicenter.

Although curares have been carefully studied as sources of medicinally valuable compounds, there remains much to do from this point of view. It would hardly be an exaggeration to state that every tribe (and often every payé) dedicated to the preparation of curare has a different formula.

There are many plants that the natives classify as poisonous for which they have no use. Especially interesting are cucurbitaceous species in the genus *Gurania*, a family that deserves closer phytochemical study.

The number of plants valued in treating such common problems as rheumatism and arthritic pains, dysen-

Kofán Indian medicine man and his student preparing curare, sources of arrow poisons; Río Sucumbios, Colombia.

From the red resinous exudate of the bark of this tree, the Indians prepare an hallucinogenic snuff, an arrow poison and an antifungal medicine for skin infections; Colombia and Brazilian Amazonia.

tery and diarrhea, sores in the mouth, festering wounds, pains in the chest, edema, persistent coughs and other pulmonary conditions, debility due to age and a host of other physical abnormalities and pathological conditions is exceptionally large.

Several species of the marcgraviaceous genus *Souroubea* are valued in the Vaupés as the source of calmative teas administered to elderly natives suffering from "susto" (psychological fear) or to induce sleep. Two or three plants—especially the cultivated cucurbitaceous *Cayaponia ophthalmica*—are employed, apparently with some success, in treating conjunctivitis, a very frequent condition in the region.

One of the medicinal uses most worthy of scientific evaluation is the application of the reddish resin-like bark exudate of several species of *Virola* and of the guttiferous *Vismia* to fungal infections of the skin, an extremely common affliction in the wet tropics. The condition often seems to clear up with this treatment in 10 or 15 days, but whether it represents a cure or merely suppression is not known at the current stage of our technical understanding. Preliminary chemical studies have yielded several chemical constituents from *Virola*—lignans and neolignans—that may possibly account for antifungal activity.

Other plants are employed in treating infections of the skin or of the mucous membrane of the mouth: the gum extracted from the pseudobulbs of the orchid *Eriopsis sceptrum*, a decoction of the bark of several species of *Vochysia*, an infusion of the leaves of *Souroubea crassipetala* and the powdered bark of the rubiaceous *Calycophyllum acreanum* and *C. spruceanum*. A warm decoction of the leaves of *Anthurium crassinervium* var. *caatingae* is used by the Kubeos as an ear-wash to relieve a painful condition due probably to fungal infection.

One of the commonest medicinal plants of the Makunas is the malpighiaceous *Mezia includens:* the root is considered to be strongly laxative when crushed and soaked in water in which fariña flour (from *Manihot esculenta*) has been sitting for several hours. The boiled leaves make an emetic tea and, when they are applied warm as a cataplasm on the abdomen, are said to help a condition that seems to be hepatitis.

Despite its toxicity, *Aristolochia medicinalis* is administered in the Vaupés to calm what appears to be epileptic seizures. The treatment is reported sometimes to be worse than the disease, since use of this tea, it is alleged, can cause insanity if not used with caution.

I have encountered several species in use as oral contraceptives: *Philodendron dyscarpium, Urospatha antisyleptica* and *Anthurium tessmannii*—all members of the aroid family. The Bara-Makú of the Río Piraparaná, who call the moracious *Pourouma cecropiaefolia, we-wit-kaf-tu* ("no children medicine"), scrape the bark from the root, rub the scrapings in water and give the drink to women; according to the natives, the drink can cause permanent sterility. These same Indians report that the leaves of *Vochysia lomatophylla* in warm chicha (a slightly fermented drink made from *Manihot esculenta*) has abortifacient properties. It is perhaps significant that the distant Campa Indians of Peru also value this

Makuna medicine man lighting a pitch torch to start a ceremony for drinking the hallucinogen caapi; Río Popeyaká, Amazonas, Colombia.

Brigmansia aurea, *one of the most potent hallucinogens employed by the medicine men of Sibuordoy, Rutumayo, Colombia.*

Vochysia as a possible contraceptive.

Several plants are widely employed as styptics to staunch the flow of blood from wounds: *Helosis guianensis* of the Balanophoraceae; *Costus erythrocoryne* and *Quiina leptoclada* of the Zingiberaceae and Quiinaceae, respectively.

The number of species for which vermifugal and febrifugal properties are claimed is naturally very high in view of the prevalence of intestinal parasites and various fevers, especially malaria. Very few of the plants so employed have been chemically or pharmacologically examined, although numerous species belong to genera recognized as having astringent properties. It will be sufficient to mention several members of the solanaceous genus *Brunfelsia* in connection with febrifugal activity: *B. chiricaspi, B. grandiflora and B. grandiflora* subsp. *Schultesii*. The ingestion of a decoction of the leaves rapidly induces a sensation of chills: in fact, the vernacular name *chiricaspi* means "chill plant."

In addition to this febrifugal use, these plants have additional applications in local medicine: in treating rheumatic pains and arthritis as well as snakebites. They may occasionally be added to the hallucinogenic drink ayahuasca (prepared from the malpighiaceous *Banisteriopsis caapi*) in order to lengthen and intensify the psychoactivity of the narcotic. And *Brunfelsia,* taken alone, can itself have hallucinogenic effects. Yet little is known of the chemistry of such a well known and highly esteemed native medicine. Chemical studies of *B. grandiflora* subsp. *Schultesii* disclosed a novel convulsant—pyrrole-3-carboxyamidine—which has been named brunfelsamidine.

In addition, then, to academic interest in anthropology and botany, a major reason for ethnopharmacological conservation is the search for potential new therapeutic agents for Western medicine. This brief account, I hope, will afford an indication, even though superficial, of the wealth of material that ethnobotanical studies in one small area of the tropical world present—the northwest Amazon. Multiply this many times to include the numerous still more or less untouched parts of America, Asia and Africa. It is at once obvious what a vast reservoir of still virgin information on plant properties remains to be tapped and salvaged.

The pharmaceutical industry in the United States has attained in the prescription market alone annual sales in excess of $3 billion from medicinal agents first discovered in plants, many of them found in use amongst unlettered peoples in aboriginal societies the world around. Can we afford any longer to neglect this prolific and promising treasure-trove of ethnopharmacological knowledge that may not long be available? □

Richard Evans Schultes, PhD, DSc, FMLS, is Edward C. Jeffrey Professor of Biology, Emeritus, *at Harvard University and former director of the Harvard Botanical Museum. He and chemist Robert F. Raffauf recently published a compilation of what is known about 1,516 species of plants in the Northwest Amazon, a book called* The Healing Forest: Medicinal and Toxic Plants of the Northwest Amazonia *(Dioscorides Press, Oregon 1990).*

Richard Schultes with Tikuna children, sons of medicine man; Río Horetoyacú, Amazonas, Colombia.

CORPORATE CASUALTIES

Alcoholism on the Fast Track

by Jeffrey Lynn Speller

I first met Bill shortly after he had been admitted to the hospital. He was in a semi-comatose state with a high blood-alcohol level, evidence of a major gastrointestinal bleed, and liver-function test results that were significantly elevated. One evening his wife had found him passed out on the bathroom floor. Earlier that day he had imbibed, by his wife's account, at least a fifth of vodka and several six-packs of beer.

Bill was a 62-year-old CEO and the father of three grown children. For the past 27 years he had been a very successful founder and head of a large manufacturing firm. He was also known by his friends and colleagues to be a hard-driving, hard-drinking ex-Marine who had motivated his employees with both the carrot and the stick.

Business had not been good for Bill that year because of the local and national economic downturn. Several weeks prior to his admission, Bill learned that a very large government contract he had hoped to win had gone to a major competitor. The lack of new business meant that Bill would eventually have to lay off a third of his workforce. Shortly after hearing the news, Bill's drinking greatly increased as he attempted to drown his sorrows every night after work with larger and larger amounts of vodka, wine and beer.

What happened to Bill? Why did he go off the deep end? Bill is an alcoholic. For many people, the term brings to mind images of homeless men slumped in doorways, sipping cheap wine. In fact, an alcoholic can be anyone from the stockboy to the chairperson of the board. An alcoholic is an individual who imbibes repeatedly, excessively and uncontrollably, resulting in significant impairment of his or her physical health and social and occupational functioning.

Although tragic, Bill's case history is certainly not unusual or remarkable. It is a scenario that is all too real for many top-level executives suffering from the effects of alcoholism—a disease that is often covered up, ignored, denied or kept hidden. When it comes to alcoholism in the executive suite, mum is frequently the word. Nevertheless, as Bill's story clearly demonstrates, alcoholism is a disease that can destroy the lives and careers of even the most successful businesspersons and professionals.

Alcoholic senior executives can be very costly to an organization. They

may lose sight of their priorities, miss deadlines and think irrationally. They may forget important meetings, make bad decisions and act impulsively. They may lower morale and irritate and frustrate their colleagues. They may become distrustful and suspicious and derail important business deals. They may lose their perspective and misconstrue events. They may unexpectedly become confused and indecisive and let important business opportunities go by. For example:

The 64-year-old founder, chairman and CEO of a medium-sized wholesale establishment, who drank a fifth of vodka a day for more than 30 years, began having difficulties concentrating and had significant memory lapses. His behavior and thinking became so erratic and agitated that he was no longer effective as a leader. He was forced to step down.

A 38-year-old divorced senior vice-president for human resources, who drank to excess, became depressed due to a dating relationship ending and overdosed on sleeping pills and alcohol.

A senior manager with a history of driving-while-intoxicated charges had too much to drink at a company function one evening, ran a red light and slammed his car broadside into a Volkswagen carrying four college students, two of whom were killed instantly. He was charged with vehicular homicide and driving under the influence.

When the alcoholic is the CEO, his or her illness can cost an organization hundreds of thousands of dollars in bad decisions, and can adversely affect the productivity and competitiveness of the firm as a whole. The eventual personal cost of the untreated alcoholic senior manager can also be very great: the end of a career, the loss of a stable means of financial support and the disruption of a family. But if these individuals are identified and treated early in the course of their illness, then many of them can return to productive and satisfying careers.

The oldest of eight children, Bill grew up in modest circumstances. His father, Jack, was a hard-working but devoted father who came from a long line of heavy drinkers. Bill's paternal grandmother was a quiet drinker who lived alone after the death of Bill's grandfather and who liked to drink to help her sleep. She eventually became alcoholically demented and had to be placed in a nursing home. Bill's paternal grandfather died prematurely of cirrhosis of the liver.

Bill had his first drink at the age of 14 when he began sneaking some of his mother's cooking sherry. In high school, Bill and his high school buddies would drink a couple of six-packs on the weekends. In college Bill would drink a six-pack by himself several nights during the week, and yet be able to attend classes the next day. After college, Bill enlisted in the Marines. After a four-year hitch, he came home, married his high school sweetheart, and began working for a small firm in his hometown.

Ten years and several firms later, Bill decided to start his own manufacturing business and was an immediate success. For the past 20 years, sales and revenue growth consistently exceeded expectations. In spite of the downturn in the economy, the prior fiscal year for Bill was the third best in the company's history.

In spite of his tremendous business success, Bill admitted that he gradually became dependent on alcohol. As he tells it:

"I had a tough job and it took a lot out of me. I guess I didn't realize what the wear and tear was doing to me. I guess I drank to ease the pressures and to help me relax when I got home in the evening. It was not unusual for me to have three or four drinks before dinner, a bottle or two of wine with the meal, and a couple of cordials after the meal. Before I went to bed I would sometimes stumble over the bedroom furniture just walking to the bathroom.

"During this current fiscal year I began drinking at the office. I kept several flasks of liquor in my desk drawer and sipped from them between meetings and when I would have lunch at my desk. In the mornings my hands would shake so badly I couldn't hold a cup of coffee. I would have to take several shots to settle my nerves. Every now and then my business partner would pull me aside to say that I was slurring my words during a meeting or smelling of alcohol when I came to work in the morning."

About six months prior to his admission, Bill's wife, concerned about his increasing alcohol intake, suggested that he cut back. Bill reluctantly agreed and abruptly "went on the wagon," which turned out to be a mistake. Five days after Bill stopped drinking, he began to sweat and feel nauseated.

"One night I woke up abruptly and thought I saw dozens of snakes crawling all over the floor and overrunning the place. I thought I was at the office and I thought my wife was my secretary. I demanded that she call security immediately. I ran down the stairs to the living room and began looking for the name of an exterminator in the yellow pages. Being fearful of my behavior, my wife called an ambulance and I was taken to a local hospital to 'dry out' for 10 days."

Alcoholics like Bill share a number of salient characteristics and behaviors: including the consumption of a fifth or more of spirits a day; the need for alcohol on a daily basis in order to function adequately ("I was always looking for the next drink—I couldn't face the day at work without a couple of shots in the morning."); the desire to remain continually intoxicated for several days or longer; the inability to decrease or stop drinking for an extended period of time ("I thought I could control it but I couldn't—it controlled me."); and blackouts ("There were days at a time that I just couldn't remember what happened.").

Other salient characteristics of alcoholics include combining alcohol with other drugs; ignoring major medical or neurological illnesses that were the result of, or exacerbated by, contin-

ILLUSTRATIONS BY JULIA TALCOTT

ued drinking ("I got stomach ulcers from my drinking but I didn't care if I bled to death—I just needed the next drink."); legal difficulties resulting from driving while intoxicated ("I was dragged into court more than once for driving while intoxicated. I was a real menace on the road. I drove like a maniac. I would always make sure that I had a case of booze in the back of the car in case I found myself without a liquor store nearby."); and poor social and occupational functioning, including absences from the job, poor job performance, arguments with superiors and peers and poor marital relations.

Bill gradually increased the amount of alcohol he consumed so that by the time he started treatment he had been drinking very large amounts on a daily basis—before, during and after work. He developed such a tolerance for alcohol that he had to drink larger and larger amounts to get the same effect. Bill became physically dependent on the alcohol to the point that when he abruptly stopped drinking on his own, he soon went into withdrawal.

From a neurophysiological point of view, alcohol acted as a toxin that altered and distorted his brain structure and function. From a genetic point of view, Bill was the product of a family that had significant problems with alcohol—his father, grandmother and grandfather were abusers of alcohol. Given this family history, it is likely that Bill was genetically at risk of inheriting a biochemical vulnerability to alcoholism. The strong family tradition of drinking undoubtedly shaped Bill's early views about drinking as a highly desirable social activity. During the course of his recovery, he admitted that he equated heavy drinking with manhood and believed that it was a socially approved way of doing business.

Bill's early psychological development was probably adversely influenced by his father's alcohol problems and history of marital conflict. Psychological testing administered during Bill's admission indicated that Bill was a depressed and angry individual with very low self-esteem and a poor self-image, which he attempted to boost by succeeding in the traditional way in his chosen field. The results further indicated that Bill reacted defensively to criticism, adapted poorly to changing environmental circumstances, had problems with poor impulse control, had difficulty with intimate relationships, and used primarily denial, repression and projection to defend against intrapsychic pain. Poor psychological functioning caused Bill to continue to drink, which in turn caused greater impairment in his psychological functioning.

During the initial phase of his hospitalization, Bill had great difficulty opening up and relating in more than a superficial way to other patients and staff on the unit. He had difficulty identifying and expressing his emotions and resisted developing insight into the reasons for his current difficulties with alcohol. At times he would

sulk and appear moody and would refuse to talk to the other patients and staff about what was really bothering him. He used a gregarious, joking and confident demeanor to hide his personal insecurities. He reacted defensively to constructive criticism and had a low frustration tolerance, with difficulty accepting the rules and limits of the unit.

After a period of time in the hospital, Bill began to open up more. He described himself as an angry and depressed individual who frequently felt disappointed with his father, whom he loved, feared and resented. He felt that as a child he had never gotten enough attention or guidance from his parents. Bill learned to suppress his anger, resentment and depression and instead tried to be like his father, using alcohol to drown his emotional pain.

Bill's case represents the hidden problem of executive alcoholism. Because of the intense medial coverage of alcoholism and drug abuse in society as a whole, and in the work place in particular, these issues have come into the public's awareness. Television specials on alcoholism, articles in the popular and business press, books by recognized authorities, and television and radio spots by treatment facilities extolling the virtues of their alcohol rehabilitation programs, all have increased the general level of awareness of these problems.

Over the course of the last 15 years, many employers have begun to take a more aggressive approach to employee alcoholism. Given the increasingly competitive global marketplace, employers are under even greater pressure to hire and retain employees who are productive, emotionally stable and committed to organizational objectives. Employers have also come to realize that replacing previously effective, knowledgeable and experienced employees is expensive.

Because of this new perspective, employee assistance programs (EAPs), designed to detect and deal with the impaired employee, are now a fixture in many institutions. Because of these efforts, many firms have experienced significant success in dealing with and managing the alcoholic blue-collar worker, supervisor or middle manager. Yet in spite of all these programs, the alcoholic senior managers like Bill continue to elude the best efforts of many firms. Why?

Over the years I have counselled a number of senior executives who were in trouble with alcohol:

A senior financial officer of a major high-tech firm and a recovering alcoholic stated, "The number of active alcoholics in the senior management ranks in this company is astounding, yet only one in ten is willing to get help."

From a 52-year-old senior marketing executive who was a heavy drinker for more than 30 years before he finally realized he was in trouble: "My alcohol problem was so bad that I needed three strong drinks before work in the morning just to make it through to lunch. But no one at work suspected that I had a problem until it was nearly too late."

"When I went for treatment for my alcohol problem, my executive colleagues in the corporation thought that I was crazy to risk my career by admit-

ting my problem," said a senior vice-president of sales from a Fortune 500 firm in New York.

"Although I was drinking a fifth of vodka a day, not even my closest colleagues at work suspected that I had any problems—that is, until I went into the DTs," explained a 51-year-old hospitalized senior executive who was recovering from delirium tremens.

There are a number of reasons why the senior executive with an alcohol problem may elude the best efforts of the firm's early warning system for the detection of alcoholism among the employee work force. First, loyal subordinates, out of a misplaced desire to be helpful, may cover up for a senior executive's alcohol problem. No one, particularly loyal subordinates, likes to admit that the "chief" is ill and in need of professional help.

More commonly, subordinates will hope that their boss's current problem with alcohol is a phenomenon that will get better on its own—the boss will "one day" decide to give up drinking. Thus, subordinates will cover up for the chief's mistakes and inappropriate behavior. Unfortunately, in this scenario, things usually go from bad to worse as the senior executive becomes increasingly impaired while being deprived of the early professional intervention that could be so helpful.

Many senior executives, because of the nature of their position and job responsibilities, lack close day-to-day supervision. They exercise great latitude in their jobs and structure their daily activities and manage their time as they see fit. Consequently, day-to-day executive accountability is difficult, if not impossible, to establish. In addition, there may be very few colleagues in the firm who have the sufficient status, supervisory authority, desire or knowledge to confront and follow through if they suspect that a senior executive is becoming impaired.

Third, many senior executives view asking for help as a sign of weakness. A number of senior executives believe that they must maintain an image of toughness in order to justify their own high status and position with the firm. Because of the societal stigma attached to seeking professional help, many senior executives believe that any sign of weakness or distress would open the door to rivals within the firm. As one CEO put it, "The sharks are always circling. Once they smell blood, you're dead." The executive's fear of reprisals if his or her need for help became known contributes to a deepening sense of isolation and estrangement from helping professionals.

The high compensation of senior executives may, paradoxically, also contribute to their impairment. The alcoholic senior executive is different from the average chemically-dependent individual in that high income allows him or her to continue to drink excessively without major financial problems. Some of these impaired executives even view their excessive alcohol consumption as an "earned right" in exchange for accepting the

inherent stresses in the corporate lifestyle, or as a reward for their years of sacrifice and hard work while climbing the corporate ladder.

Finally, senior executives resist using corporate-sponsored programs that traditionally have served blue-collar, supervisory management and even middle-management employees. Many senior executives have the mistaken belief that what may be good for their subordinates may not necessarily be good for themselves. As one executive vice president put it, "I pay those guys' salaries [referring to his firm's in-house EAP professionals]. They work for me. I will be damned if I'll now turn around and go down and ask them for help."

Senior executives have been known to avoid their own in-house professional help because of fear of the possible breach of confidentiality or concern about "inverting" the traditional and clearly identified superior/subordinate roles in the firm.

Given that the alcoholic senior executive may elude the best efforts of his or her firm's early warning system, the responsibility for the detection of the executive alcoholic often falls on the shoulders of the executive's personal physician. When an executive visits your office, it is important to be alert to the signs of alcoholism, regardless of the presenting medical complaint. Although alcoholic executives, like all alcoholics, will deny, rationalize and minimize their drinking, the signs and symptoms of serious alcohol abuse can usually be uncovered through a careful history and physical examination.

When eliciting the history of the current illness and medical signs and symptoms, no matter what the chief complaint, be sure to routinely include questions about morning hand tremors (tremors induced due to lowered blood-alcohol levels during the night resulting in mild withdrawal reaction when the alcoholic arises); sleeping difficulties (all night "benders" in which they get little sleep); recent weight gain (due to ascites or due to the high caloric content of alcohol); and recent weight loss (due to the restricted intake of a proper diet in favor of alcohol).

Ask about blackouts (periods of amnesia for events during a period of intoxication); seizures (due to alcohol use lowering the seizure threshold); and problems with gait, peripheral sensation and sexual dysfunction (which can result from alcohol induced cerebellar degeneration producing truncal ataxia, and peripheral neuropathy).

Inquire about the presence of current signs and symptoms of other known medical complications of alcohol use, including gastritis, ulcers, pancreatitis, gastrointestinal cancers, alcoholic hepatitis, cirrhosis of the liver, chronic pancreatitis, neurological disorders and major infections including pneumonia. Question the executive about periods of shaking associated with some malaise, nausea, anxiety, depressed mood, headache and irritability—this may point to past problems with alcohol withdrawal. Be certain to ask the executive about a history of falls, accidents, head injuries, fractured ribs, or broken arms or legs—all of which can be a consequence of a lack of coordination during an intoxicated state.

When taking the medical history it is also important to ask directly how much the executive drinks, with whom, where and the date of the last drink. This questioning is in order to uncover inappropriate attitudes about alcohol and unusual patterns of alcohol consumption. Individuals who admit to imbibing significant amounts of alcohol (four or more drinks) on a daily basis may have crossed the boundary between social drinking and alcohol abuse. This is particularly so due to the alcohol abuser's tendency to understate, often by as much as half, the actual amount consumed on a daily basis.

Be alert to the executive who says that he or she usually drinks three or four drinks quickly at business social functions as a way to "relieve stress" and to "loosen up." Pay attention to the executive who justifies the consumption of large amounts of alcohol as a "necessary part of doing business" and who may drink not only at lunch but at other points during the work day. Executives who say that they only drink at home alone after work may also be at risk for alcoholism, particularly if they consume significant amounts; three or four cocktails before dinner, a bottle of wine with the meal and several cordials after dinner.

Ask the executive if he or others—business colleagues, friends or family members—have noticed any change in his personality when he drinks. Many alcoholics will often become irascible, irritable, difficult to get along with, temperamental and erratic. Quiet executives may become blowhards. Extrovert executives may become isolated, withdrawn, quiet and depressed. A history of family arguments, marital difficulties, and separation or divorce may also point to a problem with alcohol abuse. Given the familial patterns of alcohol abuse and addiction it is also important to query the executive about alcohol use and abuse of spouse, parents, children and siblings.

Inquire about missed deadlines, recent business decisions that turned out poorly and absences from work, particularly on Mondays and Fridays. They may miss work due to alcoholic binges, recovering from a hangover, or recuperating from a medical illness related to alcohol use.

Question the executive about other prescriptions and nonprescription use of drugs. Cross addiction is an increasingly common phenomenon at all strata of our society. A significant number of addicted executives indulge in the use and abuse of alcohol, cocaine and marihuana. Addictions to sleeping pills, pain relievers and other stimulants, including amphetamines, are also increasingly common in executives caught in the "fast track" of life.

Question the executive about significant and repeated legal difficulties. Alcoholics come to the attention of the court for a variety of reasons, including drunkenness in public and creating a public disturbance, driving recklessly while under the influence, and violent outbursts while in an acutely intoxicated state.

Any complete medical history should also include questions about the executive's current and past psychiatric status. Question the executive about recent bouts of sadness and depression, crying spells, anxiety, suicidal ideation, fatigue, feelings of helplessness or hopelessness, and problems with concentration or memory. Not uncommonly, alcohol abuse can precipitate or aggravate preexisting psychiatric syndromes. Be sure to inquire about a past psychiatric or substance abuse treatment, including detoxification, rehabilitation, psychiatric hospitalization, psychiatric medication, outpatient substance abuse treatment and counselling, family history of substance abuse treatment, attendance at AA, NA or Alanon, or stays at halfway houses.

During the physical exam be alert to the more common signs of medical complications of alcohol addiction: including truncal obesity, fluid in the abdomen, an enlarged liver, gait disturbances, peripheral neuropathies, guaiac positive stool, lesions in the oral cavities, testicular atrophy, evidence of old trauma, orthostatic hypertension. Look for other signs associated with gastritis, ulcers, pancreatitis, liver disease, cardiomyopathy and other cardiac diseases, cancer, infections, kidney disease, hypertension, megaloblastic anemia, and neurologic diseases. Review gross cognitive functioning, being alert to the signs and symptoms of Korsakoff's syndrome, dementia and alcoholic hallucinosis.

Carefully review all laboratory tests: an elevated mean corpuscular volume (MCV), serum gutamic-oxaloacetic transaminase (SGOT), serum glutamic-pyruvic transaminase (SGPT), lactate dehydrogenase (LDH), and serum gamma-glutamyl transpetidase (SGGT) may point to a problem with alcohol abuse. Decreased albumin, B12 and folic acid may point to prolonged malnutrition secondary to alcohol abuse. Laboratory findings consistent with bone marrow suppression, certain types of infection, pancreatitis and hepatitis may also indicate a significant problem with alcoholism.

Bill was a victim of the disease of alcoholism. His disease impaired his professional performance, threatened his career and disrupted his friendships. Given the fact that the alcoholic senior executive may elude detection by colleagues in his or her firm, the executive's personal physician is in the best position to detect the presence of alcohol abuse and addiction. With careful attention to the warning signs and symptoms followed by prompt referral and appropriate treatment and rehabilitation, executives like Bill can be returned to fully functioning and productive lives. □

Jeffrey Lynn Speller '74, MBA '79 is the co-founder and principal of the Leadership Consulting Group—a management consulting and leadership development firm specializing in leadership and executive performance, based in Belmont, Massachusetts. Formerly, he was a lecturer and executive director of the Leadership Research Project, department of psychiatry, Cambridge Hospital, Harvard Medical School. He is the author of Executives in Crisis: Recognizing and Managing the Alcoholic, Drug-Addicted, or Mentally Ill Executive *(Jossey-Bass, 1989).*

PLAYING WITH DRUGS

The Perils of the Competitive Edge

by Rafael Campo

As the world's preeminent sporting event, the upcoming 1992 Olympic Games are already making headlines. So are the athletes who take performance-enhancing drugs in quest of world-record performances. For some, winning can mean gold medals, fame, and million-dollar product endorsement deals. But the stakes may be even higher in terms of the health of these young people. The reason: the proliferation of ever more powerful drugs, whose profound effects on the developing human body raise questions of whether athletes can be engineered like machines.

Whether drugs in general actually help athletes to compete better is currently subject to much skepticism, despite historical claims that they do work. The use of substances to enhance athletic performance dates back to the earliest Olympics. Competitors in ancient Greece are thought to have consumed herbs and mushrooms before sporting events. The 19th-century French endurance athlete enjoyed a mixture of wine and coca leaves!

In more recent times, however, the use of drugs has come to be viewed negatively. This perception of drug use in sports parallels the development and availability of more and more sophisticated agents. "These days, you can't predict who is using steroids," says Lyle Micheli '66, associate professor of orthopedic surgery at Harvard Medical School and Children's Hospital. "Increasingly, it's amateur athletes in college and even high school."

During the 1940s and '50s, modern medicine provided stronger synthetic agents geared specifically toward improving the endurance of the human body. Around the same time, "drug abuse" in sports began to be considered a problem—enough of one to prompt efforts at documentation. The first charges of stimulant misuse were made at the 1952 Winter Olympics in Oslo, Norway.

In later years, competition between nations in athletic arenas like the Olympics, especially between Western and Communist countries, assumed political importance and heightened pressures on athletes to win. Stronger drugs were also developed. By 1954, the use of anabolic steroids in Russian athletes was suspected. Anabolic steroids and amphetamines were in widespread use in the 1960s, and after amphetamine overdose had been implicated in the deaths of several cyclists during Tokyo's 1964 Olympics, the International Olympic Committee (IOC) instituted drug testing at the 1968 Olympic games in Mexico.

Meanwhile, early drug-using in lower-profile arenas such as colleges and high schools went unsuspected. Says Mary Jane O'Neill '92, a member of the United States Olympic and National teams in fencing for many years, "When I started out, I was amazed by how many athletes were using drugs, mostly in sports like weightlifting. There were no education programs then, and there still aren't."

Today, as new pressures on athletes to excel have evolved, so have even more potent drugs. "For young people today, who see the fame and glory successful athletes may achieve, and the glamorous commercials they make, the message is 'it's worth it' [to take drugs]," says Harrison Pope '74, associate professor of psychiatry at HMS and McLean Hospital, and himself a body-builder. "Increasingly, even the desire to improve personal appearance is a motivation in these individuals."

In the largest study conducted to date, a group of researchers found that 6.6 percent of 12th grade male students used or have used anabolic steroids, and that over two-thirds of them initiated their use when they were 16 years old or younger. "Among elite athletes in sports requiring strength (line positions in football, shot-put, bodybuilding, and etc.), the prevalence of steroid use may approach 100 percent," says Pope.

O'Neill concurs: "You're at such a disadvantage if you don't take drugs. It's almost like being left out."

At the same time, the advent of more accurate drug-testing methods and stiffer penalties for users have led to greater public awareness (and disapproval) of drug use. In 1983, 19 athletes were disqualified from the Pan American Games in Caracas, Venezuela; many others withdrew voluntarily, presumably fearing detection. In 1988 in Seoul, as the world looked on with dismay, Ben Johnson of Canada was stripped of his gold medal after steroids were detected in his urine samples. Most recently, American track and field stars Butch Reynolds and Randy Barnes, each world record-holders, are now appealing two-year suspensions from their sports for alleged steroid use. Their hopes of competing in the 1992 Barcelona Olympics are dim.

The aspirations of youngsters who looked up to them as heroes are also tarnished. As O'Neill sums it up, "It distresses me that it's such a big problem, and that it's spreading to more and more sports. It bastardizes the whole idea of 'sport'—it's just plain cheating."

With pressures running so high in the sports world, several crucial issues emerge in thoughtfully examining drug use in sports. First it is necessary to identify the drugs in use. Their true efficacy in enhancing performance should be weighed against their adverse effects. Most important, the implications of their use—especially in a modern age where the blueprints of the human body, and hence the ways to rewire it, are better understood—deserves to be questioned.

The categorization of drugs (see sidebar page 46) is easier in theory than it is in practice. Some drugs may belong in more than one category. Albuterol, the anti-asthmatic drug used by Florence ("Flo-Jo") Joiner, has been shown to have some ergogenic, or performance-enhancing, properties. Notoriously ergogenic drugs like anabolic steroids and amphetamines may produce addictions as devastating as some of the drugs classified as illicit; conversely, cocaine abuse begins in some athletes who take it first for its ergogenic effects.

Some substances may not even be considered drugs at all by many athletes. For example, alcohol and caffeine are in many socially-accepted forms. Like the substances employed historically in sporting events, their potential benefits seem at first glance to be largely psychological, and they appear harmless. Kids see their parents using these substances every day. Closer study has suggested, however, that the traditionally lenient approach to these agents may not be warranted.

The ergogenic property of alcohol, according to athlete's lore, is to induce a state of relaxation. Modern studies of alcohol use in college runners refute this claim, demonstrating instead marked deterioration of performance. Of more concern, however, are the adverse effects of alcohol dependence. The early association of alcohol with sports in adolescence, the high-stress lifestyle of the professional athlete, and the significant periods of inactivity due to the seasonal nature of many sports all make athletes particularly vulnera-

Competitors in ancient Greece are thought to have consumed herbs and mushrooms before sporting events.

THE BOOK OF KNOWLEDGE, NEW YORK: THE GROLIER SOCIETY, 1908

PHOTO OF BEN JOHNSON (#159) BY AP/WIDE WORLD PHOTOS

As the world looked on with dismay, Ben Johnson of Canada was stripped of his gold medal after steroids were detected in his urine.

ble to alcohol abuse. Accidents also happen in contact sports when alcohol is used.

Caffeine is another "hidden drug." It's in coffee, tea, chocolate, soft drinks, over-the-counter caffeine preparations, and is an ingredient in many other drug preparations. The long-held belief among athletes is that consuming large amounts of caffeine confers a psychological advantage in competition. Caffeine is also thought to stave off fatigue and increase strength in endurance sports. Hence, caffeine is also classified as ergogenic.

Unlike alcohol, caffeine does confer a performance edge. Caffeine helps to utilize certain high-energy fuels in the body (fatty acids) preferentially. At the same time, it spares other fuels (animal starches, or glycogen) which can be burned more easily in later stages of endurance exercise. Besides favorably shifting energy metabolism, caffeine acts on the brain to decrease perceptions of fatigue. Strength, however, has not been shown to increase in the presence of caffeine.

Unlike patterns of drug-seeking behavior in adults, notes Pope, the use of these two substances "does not predict abuse of other drugs such as steroids." Some studies have linked the early association of alcohol use and sporting events to later alcohol abuse.

Among newer synthetic agents that are claimed to be ergogenic by athletes, it is not clear that expected benefits outweigh the more ominous risks—or even whether the drug helps at all. Moreover, these drugs do not appear on everyday "menus." They were developed specifically to alter physical functioning, and they must be sought out deliberately by athletes. "Many of these athletes are actually dealing these drugs themselves, and making a lot of money," says Pope.

The use of one notorious drug, cocaine—within high-profile sport cultures such as college basketball—exploded into the national consciousness several years ago with the death of Len Bias, star forward for the University of Maryland. Cocaine is still considered by some young people to be glamorous, but cocaine most strongly appeals to athletes because of its stimulant effects.

Anecdotally, athletes using cocaine report increased strength, diminished fatigue, and feelings of confidence and unlimited power. It differs from other stimulants, such as amphetamines, primarily in its more pronounced side effects and in the intensity of the euphoria that it produces. This "high" might be compared to the feeling of winning or performing well before a large crowd—a sensation athletes in seasonal occupations may want to reproduce when they are inactive.

Scientific evidence for cocaine's efficacy is scarce. One recent study has already refuted the claims that cocaine increases strength; more research is under way. The adverse effects of cocaine, however, have been well-studied. Old beliefs that cocaine is not addictive have been convincingly disproved. For athletes in particular, the increased constriction of arteries in exercising heart and muscles can lead to heart attacks, derangement in body pH leading to seizures, and dangerous elevations in body temperature.

Cocaine abuse in sports has been greatly publicized also because of the "societal" side effects that accompany its use. Penalties for taking cocaine go beyond suspension from participation in sports. Athletes have been imprisoned for cocaine possession.

The first agents that athletes took expressly to improve performance were amphetamines. Sometimes referred to as "speed," these related compounds—amphetamine, dextroamphetamine (Dexedrin) and methamphetamine (Desoxyn)—were initially developed as weight-loss agents, and the earliest

studies indicated that they worked. Military research showed increased resistance to pain and better endurance in young soldiers administered the drug on long marches.

Subsequent investigation among athletes has yielded conflicting results on overall performance. But the most recent studies have shown that amphetamines do provide a marginal improvement in isolated measures of performance, including strength, acceleration, and anaerobic exercise capacity. An important qualification to these benefits, however, is that while amphetamines also prolong the perceived time to exhaustion, the drug does not actually prevent exhaustion. So the drug has the property of masking the feelings of fatigue, which endangers the athlete. Failure to heed the internal warning signals of high levels of metabolites like lactic acid could lead to seizures and disturbance of the body's tightly-regulated pH.

Other dangerous side effects of amphetamines, which limited their original use in treating obesity, are numerous. Overdose can cause excessive nervousness and irritability, paranoia, insomnia and even acute psychosis. Amphetamines also have effects on the cardiovascular system: increased heart rate, palpitations and even heart arrhythmias. Long-term abusers are subject to physical dependency and symptoms of withdrawal. When addicts self-administer the drug intravenously and share needles, they are at risk for developing AIDS, along with a host of other complications.

The other three agents pertinent to athletes also raise questions of real versus claimed effectiveness. Anabolic steroids, erythropoietin, and "blood doping" also illustrate the extreme lengths to which young athletes may be willing to go to engineer their own bodies.

"Anabolic steroids are perhaps the most notorious of all drugs misused in sports," states Lyle Micheli. Steroids have long been considered the prototypic ergogenic agent; however, since their psychological effects have become clearer, they have been recently classified as controlled or illicit substances.

Steroids—referring to a particular chemical ring structure that all these molecules share—are synthetic analogues of testosterone. Testosterone has both anabolic, or body-building, and androgenic, or masculinizing, effects. Anabolic steroids are thought to be relatively more anabolic than androgenic at therapeutic doses, hence the name "anabolic." Since traditionally they were not classified as illicit drugs or controlled substances, as with alcohol, athletes tended to underestimate their danger.

Though claimed by athletes to increase aggressiveness, lean body mass and strength, and to reduce recuperation time during training—"the young athlete often feels that it is impossible to compete without steroids in certain sports like football and the shot-put," observes Pope—the earliest studies of the effects of steroids were flawed and produced conflicting results. One recent reviewer of the literature states that anabolic steroids do increase strength, but only if dosing takes place before and during intense weight training. The athlete must also eat a specific high-protein diet, and gains are seen only in trained muscle groups. No increase in strength is observed in untrained muscles.

Other effects athletes desire include euphoria, reduced fatigue and aggressiveness. "They often feel really powerful when they're on steroids, and they feel more self confident," says Pope. These effects have been observed in athletes given steroids. However, weightlifters given a placebo during training showed similar enhancement of performance.

The negative effects of steroids are often ignored by athletes willing to pay any price to produce the greatly-exaggerated benefits, or who see the drug as natural and undetectable, and hence safe. "They only see the short-term benefits," says O'Neill.

Serious liver problems may arise and liver tumors are a rare but dreaded outcome. Since anabolic steroids are structurally related to natural sex hormones, sexual functioning and fertility may be compromised in both sexes. Men may develop breast enlargement; women suffer from acne, an irreversible deepening of the voice, and increased body hair. Fluid retention, high cholesterol, heart attacks and strokes have all been linked to long-term steroid abuse.

In adolescents, even more is at stake. Mild to severe emotional problems have been reported. "I am aware of several cases of adolescents who committed suicide in connection with steroid-induced mood disturbances—and you just can't predict who is going to be affected," states Pope. Finally, since these drugs are often administered intramuscularly, the possibility

The negative effects of steroids are often ignored by athletes willing to pay any price to produce the greatly-exaggerated benefits.

of HIV transmission has also been documented.

Erythropoietin is a naturally-occurring hormone that is produced in the kidneys and secreted into the blood in response to low oxygen levels. The protein travels to the bone marrow, where it speeds up the production of red blood cells. Red blood cells, or erythrocytes, contain hemoglobin, another protein that binds oxygen when erythrocytes pass through the lungs. With more circulating erythrocytes, the body's oxygen-delivery system is improved.

Genetically-engineered erythropoietin has recently become commercially available. Like other human hormones manufactured in this way, it is very costly. Originally developed for use in patients with anemia caused by chronic kidney failure, athletes have recently recognized its potential value in healthy individuals: by increasing the amount of oxygen delivered to exercising tissues, an ergogenic effect is possible. Oxygen delivery is one of the several limiting factors in burning carbohydrate fuels in muscle cells. Extra oxygen helps generate much more energy for muscle cells than when the same fuels are metabolized in the absence of oxygen.

To date, no studies have been performed to examine the potential benefits of erythropoietin use in athletes. But athletes and trainers cite many studies that have demonstrated a clear-cut competitive advantage after blood doping (a technique whereby the number of red blood cells is also increased by transfusing donated blood into a healthy athlete). They suppose the same ergogenic effect would be produced in athletes who misuse erythropoietin. According to O'Neill, "People are definitely interested in any of these new agents."

Erythropoietin itself has relatively minor side-effects, although occasionally severe allergic reactions have been reported. It has none of the risks associated with transfusion practices in athletes who previously practiced blood doping. These qualities of erythropoietin have led to its perception as a very safe ergogenic aid.

There are serious dangers, however, in increasing erythrocyte numbers. The blood viscosity increases, which may lead to abnormal clot formation—a grave risk for athletes traveling for long distances by plane. (Blood clots that form in large leg veins during prolonged sitting may migrate to the lungs and cause sudden death.) These dangers exist in theory but have yet to be studied in athletes.

Because it is a naturally-occurring substance in the body, exogenous erythropoietin is very difficult to detect. Currently, the IOC is investigating ways of looking at ethical problems that today's hormone use in sports creates. Some parents have already inquired into the use of hGH in small amounts for their normally-developing children. These parents, some experts suggest, hope to produce individuals with advantages in size and stature that would be permanent. Such use might be compared to the use of growth hormone in veterinary applications to produce, for example, larger and more meat-bearing cattle.

The use of hGH in normally-developing human children is expressly forbidden by the Food and Drug Administration. But hGH acquired on the black market may be used in an unregulated fashion. Is the problem with drugs in sports great enough to prompt physicians and sports authorities to screen for hGH use in children? That the question is even being asked is perhaps a sad commentary on the pressure faced by athletes today.

Drug use in sports is, by account of athletes and sports authorities alike, a growing problem. Sports fans are only beginning to glimpse the extent of drug use. The reality is that the use of drugs often endangers the athlete—the full ill effects are not yet known. At the very least, detection of drug use may lead to disqualification of athletes from participating in sporting events at all. Such risks seem to outweigh the negligible benefits these agents and techniques can offer. □

Rafael Campo '91 has spent the past year as a fellow in creative writing at Boston University. He is a student member of the editorial board of the Harvard Medical Alumni Bulletin.

Menu of Drugs

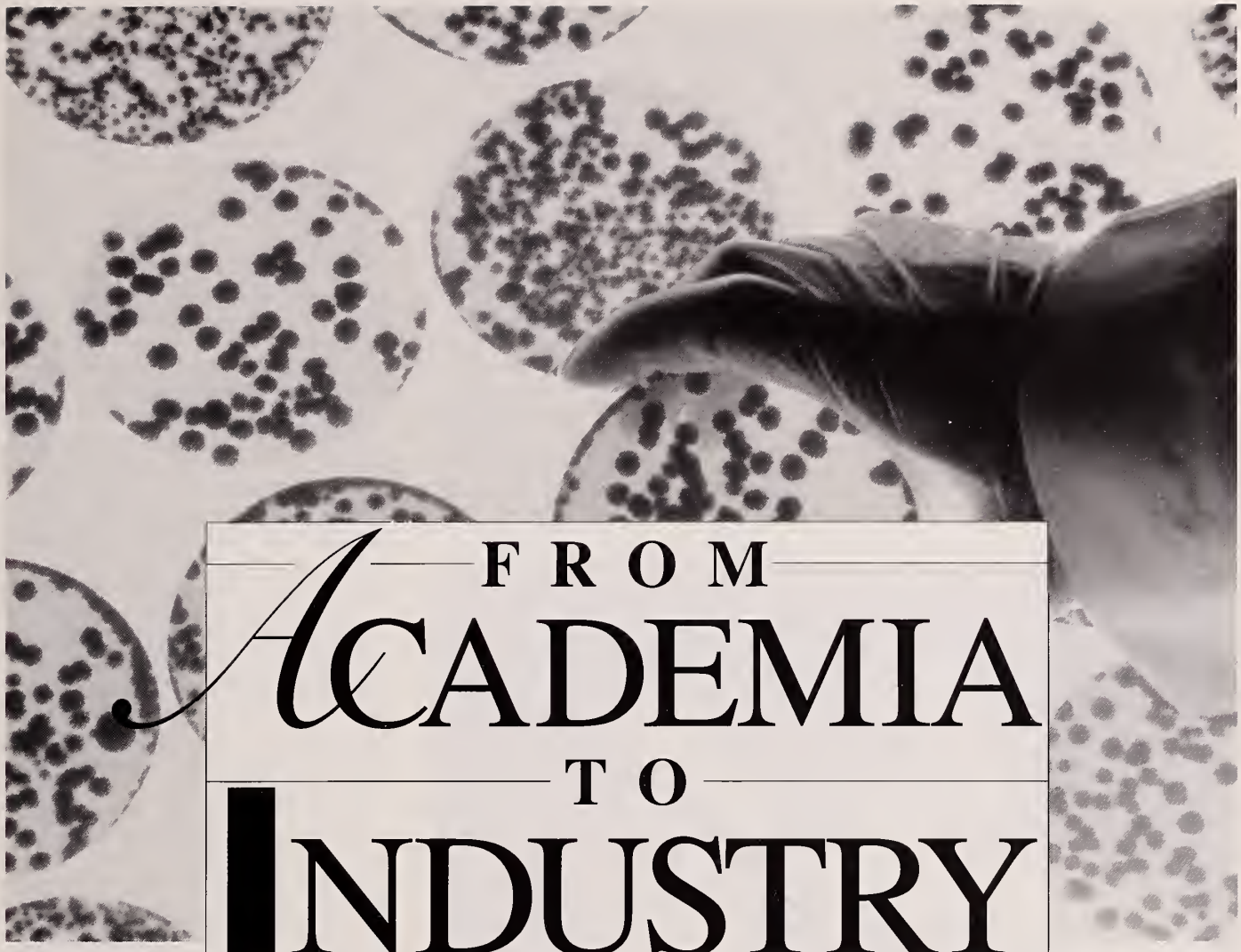
Here's a list of terms that describe various drug agents and their usage patterns:

Illicit/recreational: The illicit and recreational substances that most of us think of when we say "drugs." This group, which includes cocaine and narcotics, is typically subject to governmental control or regulation. But some of these agents occur in foods and drinks consumed in conventional social settings, such as alcohol in beer. Athletes are just as likely to abuse these substances as are non-athletes. Some have argued that the stresses and social pressures encountered by both amateur and professional athletes place them at an even higher risk for drug and alcohol dependencies.

Therapeutic: Some drugs, usually prescribed by a physician, are taken therapeutically by athletes when there's a medically valid reason for their use. Examples in this category range from vitamin and mineral supplements to anti-asthmatic drugs such as Ventolin (albuterol) for athletes who suffer from exercise-induced asthma, a condition that oceurs fairly frequently among young athletes.

Ergogenic: A third category of drugs—of particular interest to the sports world—may be defined by their ergogenic, or performance-enhancing, properties. No medical reason exists for the athlete to take these drugs. They are consumed strictly to improve athletic performance. Athletes often view these substances simply as part of a rigorous training regimen; amateur athletes often first obtain the drug from a more experienced athlete in their sport.

Examples commonly listed in this group include anabolic steroids and amphetamines. Recent additions are the increasingly available recombinant gene products: human growth hormone and erythropoietin (another hormone, which stimulates the bone marrow to make more red blood cells). Like all drugs, these agents may produce a variety of undesirable side effects—especially at the high doses athletes often self-administer for maximal performance benefits. □



FROM ACADEMIA TO INDUSTRY

A Mandate for Drug Discovery

by Michael Rosenblatt

When I was a Harvard Medical School student during the early '70s, I never would have predicted that my strong interest in therapeutically-oriented research would lead to my working for a pharmaceutical company. But seven years ago, I decided to leave my post as chief of the Endocrine Unit at the Massachusetts General Hospital and assume the position of vice president for biological research at Merck Sharp & Dohme Research Laboratories. I believe that much of the vitality of American biomedical research will depend on the success of the interface between academia and industry, and I feel that my experience in both realms equips me to pass on some thoughts concerning cooperation between the two.

When I left academia for industry, such a career change was uncommon. Certainly, the traffic between the two communities was considerably less than it is now, and occurred only at the region of overlap between the most therapeutically-oriented research in academic medical centers and the basic research interests of the pharmaceutical industry.

But some outstanding scientists had already made the transition from academia to industry at Merck. I was recruited by Roy Vagelos, a physician-scientist who trained clinically at the MGH and who now heads our corporation, and by Ralph Hirschmann, a distinguished chemist who after a long career at Merck has returned to academia as a research professor at the University of Pennsylvania. Charlie Leighton '64 was running regulatory affairs. Ed Scolnick '65, a leader in cancer and virology research, had been recruited from NIH a few years earlier and I knew we would be working together at Merck.

Why did I leave a challenging and prestigious position at HMS and MGH to join industry? Having served as a consultant for several years before joining Merck, I saw in the career change a chance for my scientific involvement to range across the broad waterfront of biomedical research. After about 10 years as an endocrinologist involved in teaching, clinical practice and endocrine research, I was asked to lead or

PHOTOS COURTESY OF MERCK SHARP & DOHME

participate in research directed at discovering new therapies for several of the pressing medical problems of our time. When I arrived at Merck, I immersed myself immediately in cardiology research on anti-arrhythmics and anti-hypertensives, cancer research on oncogenes and ophthalmology research on glaucoma. AIDS was to come later.

Previously, I had been writing grants and reading in endocrinology and biochemistry; at Merck I needed to learn broadly about medicine in a way that I had not done since my days as a medical student and house officer. The commitment went well beyond the general statements that I previously included in NIH grant applications about the medical relevance of research.

I now read journals and attend lectures with a new intensity, which stems from the mandate to discover new drugs. For every research program, we regularly ask the question: is there a better or more promising project that we should be working on instead? At Merck I can start new projects with speed, but learning when and which projects to stop was more difficult and every bit as important. This approach to managing resources is not taught vigorously in academia, where perpetuation of projects sometimes becomes the goal because of the nature of the granting system.

The need to establish new research programs also brought the opportunity to recruit first-class scientists (some from HMS!) and build a scientific community at our West Point, Pennsylvania laboratories. Amongst those we recruited were Paul Friedman '69 and later Margaret Liu '81. We put teams together under their supervision, recruiting over 150 scientists drawn by the excitement of the science, and launched new drug discovery programs in bone biology and osteoporosis, blood clotting and thrombosis, and immunology and vaccines.

The purification step in the manufacturing process for Recombivax HB, the hepatitis B vaccine.

Within two years of my arrival at Merck, the causative viral agent of AIDS was discovered in academia. We made the decision to embark on an ambitious program directed at discovering anti-viral therapy for patients already infected with the virus, and to establish a collaborative program with the Boston-based Repligen Corporation to design a vaccine to prevent infection and disease. The AIDS project soon became our largest program. As an attending physician, I would have encountered AIDS on "visit rounds." At Merck, I was leading a group of over 50 scientists in an effort to find a treatment. On a personal level, I felt the basis of my career decision confirmed: leadership of projects so diverse and important would rarely have come to an endocrinologist in an academic setting.

Science is not the only vista that has broadened. The geography of biomedical research has become global. The United States no longer dominates the training of scientists as it once did, and impressive talent pools have emerged in Europe and Japan. As part of Merck's effort to create a "global laboratory," I was asked two years ago to establish two new major research facilities, in Italy and Japan, and to recruit scientists into cancer, viral and cardiovascular research.

A new series of challenges arose as I tried to "network" across oceans and cultures. Our new Institute of Molecular Biology Research located just outside Rome opened in May 1990. When fully staffed, it will house approximately 100 scientists working in the area of virology and virally-caused cancer. With Europe on the threshold of economic unification in 1992, I am hopeful that we can do as well in recruiting scientists and starting drug discovery programs in Italy as we have done in the United States.

In Japan, our basic research effort will be housed in a new institute in Tsukuba; a government-planned science city north of Tokyo where a new university, the research facilities of several pharmaceutical companies and other technology-intensive industries, and government ministries have lo-

cated. We plan to attract 250 of Japan's finest biologists and chemists to Tsukuba to work on drug discovery programs.

Overcoming the communications problem is a major issue in effectively leading overseas laboratories. At MGH, I used to step outside my office into my lab. At Merck, computer mail, voice mail and fax form the fabric of communications with our overseas laboratories. When the Persian Gulf War forced a travel ban and my regular visits to our overseas labs were interrupted, we used video conferencing effectively—even across 14 time zones.

Surprising to me, even the conduct of science is different in other cultures. In Japan, the importance of group harmony permeates not only business organizations, but research laboratories. Changes in research directions occur only after consensus is reached. Sometimes, even experiments are designed based on compromise between scientists with differing views. Although there are considerable differences in approach, the dedication and energy of my Japanese scientific colleagues are unquestionable. Working within this framework, I am convinced that they will make important contributions to health on an international scale.

In an environment where scientific and commercial issues interface, I was asked to forge a collaborative research arrangement with what was then a rival pharmaceutical company, DuPont. Both companies had a strong interest in the cardiovascular area, and DuPont had discovered a new class of angiotensin II antagonists for treatment of hypertension and congestive heart failure. I conducted negotiations on behalf of Merck's research division, and our competitor was soon converted into a collaborator. The partnership ultimately evolved into an arrangement of larger scope than originally envisioned, namely the joint venture DuPont-Merck Pharmaceutical Company.

With my own positive experience as background, I was eager to design a program that would expose Harvard Medical students to research in a pharmaceutical company. I recalled the reaction of many of my colleagues when I decided to join industry. Why were so many of their reactions seemingly uninformed? I think the answer is that in medical school there are no role models for a career path to industry. I now feel strongly that such career options should be made known to medical students at an early point in their training.

With the guidance of Dean Daniel Federman '53, I began a small program that, over the last three summers, has placed 25 students who have finished their first year at HMS in labs at Merck. Although Merck has a program for college undergraduates and graduate students in the sciences, I wanted to bring future physician-scientists into our laboratories.

It is clear that physician-scientists can bring an especially valuable perspective to pharmaceutical research. They have an understanding of pathophysiology and the natural history of diseases. They also have a sense of what kind of therapeutic approach or side effects are acceptable in particular clinical settings. These insights are important assets for interdisciplinary teams working in a therapeutic area.

Even if we do not succeed in attracting these young physician-scientists to pharmaceutical research, we hope to convey the excitement of drug discovery to students who will someday be leaders in academic medicine or health policy. We also want future physicians to understand the amount of work behind the medicines they will be prescribing—what goes into getting the "drug into the bottle." We also want them to witness firsthand the application of state-of-the-art methods, such as computer molecular modeling and genetic engineering, to major therapeutic challenges in medicine in fields like AIDS. We select projects for the students that are in the mainstream of drug discovery, and carefully identify scientists to serve as mentors.

There are also differences in approach that we want to demonstrate to the students. In some respects, pharmaceutical research begins where academic research ends. In academia, a project is often complete when it is ready for publication. In industry, this usually marks the starting point. Typically, the decision to initiate a drug discovery program rests on a foundation of basic discoveries and published information. We first ask if there is a medical need. If there is, then we ask if the mechanism of the disease process is understood. Can a particular macromolecule serve as the target, such as an enzyme to inhibit, a receptor to antagonize, a gene to express or suppress, or a membrane channel to modulate? And, is there a lead structure available to the chemists for initiating the design process? This rational approach to drug discovery has the greatest chance of identifying compounds that maximize efficacy and minimize side effects. Importantly, a long-term perspective (far longer than the typical grant period) is required in order to succeed.

We want future physicians to understand the amount of work behind the medicines they will be prescribing—what goes into getting the "drug into the bottle."

Even the decision process of initiating a new research project stands in contrast to the approach taken in academia. In a medical school, the independent investigator will select a new project when interest and circumstances are right. At Merck, proposals for new projects are presented monthly to a review board composed of the leaders of research. The process is comparable to having the chiefs of cardiology, gastroenterology and infectious disease evaluating the programs in endocrinology. The sense of common mission drives these leaders to endorse only what they feel are the most promising proposals.

There are also large domains of scientific effort that are critical to generating a new drug not represented in the academic medical centers. Safety assessment, the study of drug metabolism, formulation and delivery, process chemistry and vaccine production are important contributors to drug development. All these efforts are coordinated and progress through preplanned ambitious objectives and time lines for their completion. Finally, we want to impart to the students a sense of the rapid dissemination of scientific knowledge and the intensity of global competition.

Of course, interacting with students again has highlighted some of the tradeoffs I made in choosing my cur-

rent career path. I had always enjoyed both teaching and clinical medicine. Puzzling out a diagnosis and developing a clinical management plan for a patient represent a special activity: clinical problems are solved through an unusual blend of intellect and judgment. Also, I have found nothing to replace the unique doctor/patient relationship. I tried to continue my own clinical and teaching involvement at the University of Pennsylvania School of Medicine, but the demands of leading large research efforts compelled me to give this up.

Residents of an African village gather to take a new drug called Mectizan, used to treat onchocerciasis, or river blindness.

There are certain questions that I am repeatedly asked concerning the activities and motives of the pharmaceutical industry. Most often, these fall into two broad categories: what determines the price of drugs? and what is the industry doing about orphan drugs or drugs for diseases of the Third World, where there is little or no opportunity for commercial success?

Last February, I had the opportunity to represent Merck in Washington in discussions with congressmen and government health officials about drug pricing. In these discussions, I emphasized that the commercial success of pharmaceutical companies rests on the success of their research and development efforts. It is from commercial success that resources are made available for continued investment in R&D. While this point may seem obvious, there is widespread misunderstanding about the nature of drug discovery and the process of bringing a new medicine to the clinic or bedside. The pharmaceutical industry is often misperceived as simply a manufacturer of drugs. The discoverers are thought to work elsewhere—in institutions like universities, medical centers and the NIH. But the facts are otherwise—new drugs originate almost without exception in the pharmaceutical houses.

The R&D effort is an extraordinarily high risk venture. Pharmaceutical R&D is the highest risk category of industry, even higher than computers and chemicals. A recent study documents that in 1987, the cost of discovering and bringing a new drug to market was over $230 million. This number, of necessity, includes the cost of failed projects.

In addition, the R&D cycle is a long one. On the average, the elapsed time from discovery of a compound at the bench to introduction into the market is 12 years. Literally thousands of compounds must be tested in order for a few to be selected for animal toxicology studies. Then, safety assessment serves as a stringent filter that allows only a few compounds to pass through. Once safety is demonstrated, then and only then, do human studies begin. The first clinical studies are geared toward determination of safety in humans. Only after human safety is established is testing for clinical efficacy undertaken. All in all, only one out of perhaps several thousand compounds makes it to market.

Although the financial resources and manpower effort expended for each new drug are enormous, only a few are commercially successful. For new drugs, 7 out of 10 do not recover the cost of their investment; only 1 out of 10 can be categorized as a major commercial success, usually because it represents a true therapeutic breakthrough. Merck currently invests 11 percent of revenues in its R&D effort; in 1991, this budget will total approximately $1 billion.

In many respects, the pharmaceutical industry should be regarded as part of the solution rather than part of the problem of escalating health care costs. In addition to saving lives and decreasing suffering, drugs can diminish the need for surgery, decrease length of hospital stays, and return people to work. While the estimated cost of cardiovascular disease and stroke in the United States is nearly $100 billion per year, even the most successful drugs in comparison bring in $1 billion in sales per year, and only a handful of drugs reach this level of commercial success.

Similarly, Alzheimer's disease costs $80 billion per year, cancer $100 billion, and AIDS in the '90s is anticipated to cost $25 to $50 billion per year. The H2-antagonists for ulcer disease are an excellent example of treatment being considerably less expensive than the consequences of not having a medicine available.

Vaccines are the most economical medical investment. The cost of preventing illnesses such as measles by vaccine costs less than 10 percent the amount needed to treat the disease, not to mention the effectiveness of vaccines in preventing the tragic loss of lives of children, such as we in Philadelphia witnessed during an epidemic this year.

Highly effective new drugs, like lovastatin (Mevacor), which lowers blood cholesterol levels, costs the average patient about $1.60 per day. Its cost should be put into perspective, not only compared with the cardiovascular consequences of hypercholesterolemia, but also relative to discretionary spending on things like a snack from a vending machine or a pack of cigarettes.

The cost of discovering new drugs is increasing, in part because the technology required is increasingly expensive. This is true not only of basic research, but also of clinical research, where techniques such as MRI or car-

For new drugs,

7 out of 10 do not recover

the cost of their investment;

only 1 out of 10 can be

categorized as a major

commercial success.

diac catheterization may be needed in order to demonstrate efficacy and thereby obtain approval for drugs from regulatory agencies around the world. Furthermore, the difficulty of discovering new drugs becomes greater as we move from disease entities such as hypertension to more complex illnesses such as AIDS. At the same time as R&D costs increase, competition from generics and closely following medicines that act by the same mechanism of action will increase. All of these factors will put great pressures on the R&D-based pharmaceutical industry in the years ahead.

Given these economic pressures, there is a real need for favorable legislation and regulatory efforts to foster development of such therapeutic agents as "orphan drugs." There is now an industry-wide effort to address this issue. While orphan drug status has a formal definition in the United States, which is based on the number of patients suffering from a condition, there is a much larger class of "orphan" drugs. These are drugs targcted at diseases of the Third World, caused for the most part by parasites. Here, the number of patients requiring treatment can be very large, much larger than thc small number that qualifies a drug for conventional "orphan" status. However, the same lack of commercial incentive is present, in the sense that these drugs are unlikely to ever be profitable for the company that discovers them. In terms of numbers of people involved, drugs for Third World diseases represent a much greater public health issue.

The development of ivermectin (Mectizan) for treatment of river blindness (onchocerciasis) is an example. The basic science team at Merck that discovered ivermectin had originally intended its use for animal health because of its potent action against a broad variety of parasites. But the scientists and clinicians on the project team soon realized the potential of ivermectin for treatment of river blindness in West Africa.

The parasite responsible for onchocerciasis is the cause of blindness in approximately 350,000 people; another 18 million people are infected. In some African villages, 15 percent of the population is blind as a result of this infection. Ivermectin is as close to an ideal drug as one could hope for in this situation. It needs to be administered only once per year, is extremely effective, and causes few side effects. Its regular use could eliminate the disease entirely because the cycle of transmission requires passage of the parasite through a human host.

The recommendation by the researchers to management to develop ivermectin for treatment of river blindness raised a series of geopolitical questions. Neither the people who need the drug nor their governments can afford it at any price. In addition, the remoteness of the regions in which onchocerciasis is prevalent makes distribution a formidable issue. The possibility of donation at first was controversial. Would we be setting a precedent that might affect our and other companies in the future? How would other companies, who themselves might have products on the market or in development that would be useful in the Third World, respond to our donation? Would the donation of the drug for human use and its free distribution interfere with our profitable sales of the drug for animal use? Notwithstanding these and other concerns, the issues seemed to fade as we realized the impact ivermectin would have on preventing future blindness in thousands of people.

Merck is committed not only to providing the drug without charge for as long as it is needed, but also to assist in its distribution. I cannot help but feel that the clinical background of many of the leaders in the company's management contributed to the decision to donate the drug.

There are a whole series of major issues that academia and industry face in common, and each would benefit greatly from their joining forces rather than emphasizing differences. The need for scientific collaboration to discover and develop new therapies for the major and complex health problems facing us is compelling. It is fair to say that virtually every new drug emerges as a result of a fund of knowledge acquired by university-, government- and industry-based scientists and clinicians. The accomplishments and interdependence of these domains needs to be acknowledged. Serious health problems will be addressed more rapidly if academia and industry learn from each other and interface effectively.

One area in need of a common voice is the effort to obtain increased funding from the government for university-based research and training of scientists. I sense that colleagues in academia feel that industry is content with the current situation of tight budgets in academic centers because it enhances industry's ability to recruit some of the "best and brightest." In fact, both camps share the same long-term concerns. Without increased numbers of trainees, the talented people who will make the discoveries in both academia and industry will not be available in the future.

Other countries are not following the American example of providing fewer grants and less funds for training. Government expenditures in these categories are increasing in Japan and in several European countries. U.S.-based companies must urge our government to increase funding for biomedical research. Academics should be armed with the knowledge of how basic advances in medical knowledge made in academia are ultimately translated into new therapies by a vigorous pharmaceutical industry. They will be more convincing when they explain the benefits of basic research for the health of Americans. Policy-makers in Washington are attentive to the practical health and commercial advantages resulting from the presence of a strong basic research community.

The physician-scientist is blessed with many options for an exciting and challenging career oriented toward the benefit of human health. As a clinician and teacher, I experienced the satisfaction derived from helping patients and students. Now that I am engaged in pharmaceutical R&D, I know the professional fulfillment that discovering a drug brings by helping many people through the availability of new therapy. □

Michael Rosenblatt '73 is senior vice president for research at Merck Sharp & Dohme Research Laboratories.

The Travel Program Of

Alumni Flights Abroad

This is a private travel program especially planned for the alumni of Harvard, Yale, Princeton and certain other distinguished universities. Designed for the educated and intelligent traveler, it is specifically planned for the person who might normally prefer to travel independently, visiting distant lands and regions where it is advantageous to travel as a group. The itineraries follow a carefully planned pace which offers a more comprehensive and rewarding manner of travel, and the programs include great civilizations, beautiful scenery and important sights in diverse and interesting portions of the world:

TREASURES OF ANTIQUITY: The treasures of classical antiquity in Greece and Asia Minor and the Aegean Isles, from the actual ruins of Troy and the capital of the Hittites at Hattusas to the great city-states such as Athens and Sparta and to cities conquered by Alexander the Great (16 to 38 days). *VALLEY OF THE NILE:* An unusually careful survey of ancient Egypt that unfolds the art, the history and the achievements of one of the most remarkable civilizations the world has ever known (19 days). *MEDITERRANEAN ODYSSEY:* The sites of antiquity in the western Mediterranean, from Carthage and the Roman cities of North Africa to the surprising ancient Greek ruins on the island of Sicily, together with the island of Malta (23 days).

EXPEDITION TO NEW GUINEA: The primitive stone-age culture of Papua-*New Guinea,* from the spectacular Highlands to the tribes of the Sepik River and the Karawari, as well as the Baining tribes on the island of New Britain (22 days). The *SOUTH PACIFIC:* a magnificent journey through the "down under" world of New Zealand and Australia, including the Southern Alps, the New Zealand Fiords, Tasmania, the Great Barrier Reef, the Australian Outback, and a host of other sights. 28 days, plus optional visits to South Seas islands such as Fiji and Tahiti.

INDIA, CENTRAL ASIA AND THE HIMALAYAS: The romantic world of the Moghul Empire and a far-reaching group of sights, ranging from the Khyber Pass and the Taj Mahal to lavish forts and palaces and the snow-capped Himalayas of Kashmir and Nepal (26 or 31 days). *SOUTH OF BOMBAY:* The unique and different world of south India and Sri Lanka (Ceylon) that offers ancient civilizations and works of art, palaces and celebrated temples, historic cities, and magnificent beaches and lush tropical lagoons and canals (23 or 31 days).

THE ORIENT: The serene beauty of ancient and modern Japan explored in depth, together with the classic sights and civilizations of southeast Asia (30 days). *BEYOND THE JAVA SEA:* A different perspective of Asia, from headhunter villages in the jungle of Borneo and Batak tribal villages in Sumatra to the ancient civilizations of Ceylon and the thousand-year-old temples of central Java (34 days).

EAST AFRICA AND THE SEYCHELLES: A superb program of safaris in the great wilderness areas of Kenya and Tanzania and with the beautiful scenery and unusual birds and vegetation of the islands of the Seychelles (14 to 32 days).

DISCOVERIES IN THE SOUTH: An unusual program that offers cruising among the islands of the Galapagos, the jungle of the Amazon, and astonishing ancient civilizations of the Andes and the southern desert of Peru (12 to 36 days), and *SOUTH AMERICA,* which covers the continent from the ancient sites and Spanish colonial cities of the Andes to Buenos Aires, the spectacular Iguassu Falls, Rio de Janeiro, and the futuristic city of Brasilia (23 days).

In addition to these far-reaching surveys, there is a special program entitled *"EUROPE REVISITED,"* which is designed to offer a new perspective for those who have already visited Europe in the past and who are already familiar with the major cities such as London, Paris and Rome. Included are medieval and Roman sites and the civilizations, cuisine and vineyards of *BURGUNDY AND PROVENCE*; medieval towns and cities, ancient abbeys in the Pyrenees and the astonishing prehistoric cave art of *SOUTHWEST FRANCE;* the heritage of *NORTHERN ITALY,* with Milan, Lake Como, Verona, Mantua, Vicenza, the villas of Palladio, Padua, Bologna, Ravenna and Venice; a survey of the works of Rembrandt, Rubens, Van Dyck, Vermeer, Brueghel and other old masters, together with historic towns and cities in *HOLLAND AND FLANDERS:* and a series of unusual journeys to the heritage of *WALES, SCOTLAND AND ENGLAND.*

Prices range from $2,225 to $5,895. Fully descriptive brochures are available, giving the itineraries in complete detail. For further information, please contact:

Alumni Flights Abroad

Department HMS 47
A.F.A. Plaza 425 Cherry Street
Bedford Hills, NY 10507
TOLL FREE 1-800-AFA-8700
N.Y. State (914) 241-0111